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Easy Steps to Safe Swimming

A SWIMMING HANDBOOK

by
EVELYN DITTON McALLISTER, B.S.
Cortland College of Education
Cortland, N. Y.

THIRD EDITION, REVISED AND ENLARGED
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BY
EVELYN DITTON McALLISTER
Illustrated by author

To my daughters
NANCY ANN and MARY JANE
who were good swimmers at the age of four

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AUTHOR'S PREFACE

During my childhood I lived near water and spent many happy hours participating in water sports. At the age of eight I learned how to swim by grasping an over-hanging branch in the "old swimming hole" and then proceeded to the "dog paddle" and more efficient strokes. I had enjoyed swimming so much that I decided to enter that field after graduating from Cortland College of Education where I had majored in Physical Education.

In fifteen years of teaching in various camps, public schools, three Y. W. C. A.'s, and on various beaches where I had accepted Life Guard positions, I saw the need for a handbook which would help people learn to swim better and safer. Therefore, I began to analyze and describe the methods of swimming which had appealed to the majority of swimmers. As a result, this handbook is now completed with the hope that it will bring as much happiness and good health to others as my knowledge of swimming has brought to me and members of my family.

As a life guard, one has the opportunity to see millions of people who do not know how to swim, or how to help each other in the many enjoyable activities connected with the practice of easy swimming skills. About ninety percent of all visitors to our public beaches know very little about swimming techniques, and occupy their time with sun bathing, wading around in the shallow area, or participating in simple water stunts and play. These are fine for their purpose, but learning to swim is fun too, if it is approached with the natural, instinctive methods; and it's safer, too!

Drownings in the age range from four to fifty have been rated second as the cause of accidental deaths in the last few years. With this third edition, I sincerely hope that many can learn how to practice and enjoy swimming skills, and that parents can help both themselves and their children to become good swimmers. We now have many beautiful, new swimming areas, and State and National Parks with facilities for camping and swimming. Everyone should utilize them!

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Here I would like to pay tribute to a very worthy co-worker, Mrs. Geraldine Hildreth of Elmira, N. Y., who taught swimming in the Elmira Y. W. C. A. and city pools for over thirty years. She devoted her life to the teaching of swimming, and spent many hours in voluntarily training instructors and staff. Many parts of this handbook were written while we were working together, and my deepest regret is that she is not present to see it finished. However, every chapter carries some of her thoughts and enthusiasm for swimming, and it is my sincere hope that every reader can capture a small portion of her interest in swimming.

I also would like to thank Mrs. Arthur Woldt, who has assisted me with my illustrations. For much of the technical advice for this publication, I wish to express my appreciation to Dr. Ross Allen and other members of the staff of Cortland State Teachers College.

Evelyn D. McAllister

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INTRODUCTION

Everyone should know how to swim; everyone more than three years of age can learn to swim!

Thousands of people each year spend their vacations on the shores of our many lakes and oceans and try to learn to swim, usually without instruction. This handbook, therefore, is written with the hope that it will be a guide for learning the correct swimming strokes and efficient breathing for each, thus making swimming more enjoyable and less dangerous.

Swimming, from the point of view of health, has proved to be one of the best activities known for developing physical fitness, and has been used extensively in treating those suffering from polio and other crippling diseases. It is also recommended by physicians to help alleviate obesity and varicose veins, for it is the only sport that is performed in a horizontal position, thus lessening the pull of gravity on the circulatory system.

People who swim regularly enjoy a sport that gives the utmost in relaxation, and at the same time keep themselves in good physical condition. And swimming is not limited to any specific group. All types of people can become strong swimmers by developing well-coordinated and relaxed movements in the water. If this could be generally accomplished, **the number of drownings each year would diminish.**

It is a recognized fact that swimming should be a required skill of every person who rides in the many small boats and canoes. Drownings have been rising at a great speed as the sales of the popular models are increasing.

A large percentage of **self-taught swimmers establish very tiring motions** and never learn to swim well enough to swim any distance to safety. The same is true of the thousands who attempted swimming lessons and discontinued them before they really learned a strong and efficient stroke.

Many individual differences are apparent among persons who are learning to swim. In the first place, there are a number of variations in body structures which make some coordinations difficult for many swimmers. Secondly, there are varying degrees of emotional tenseness which limits the amount of relaxation in the sport. And lastly, swimming is a healthful, recreational activity which can be enjoyed by every age group, each desiring a different type of swimming.

The steps outlined and illustrated in the following pages should be read, and **re-read,** and **RE-READ,** as each swimming fundamental is being practiced. Particular attention should be given to practicing the swimming movements on land, thoroughly learning the coordinations without being inhibited by the movements of the water.

Many different approaches to swimming are presented in the following chapters, and some individuals will not be adept in all of them. **Daily practice** is one of the basic laws of learning any physical activity and greatly determines the rate of progression. Some people learn new physical movements very quickly and can learn to swim well in two weeks. There are others who will need a longer period, but with persistent effort, the goal can be reached.

Advanced swimmers should particularly learn and follow the safety suggestions in the last chapter of this handbook; they also should be teachers and guides for those who are less experienced. Every family should have one good swimmer who can assist and guide other members of the family in enjoyable and safe water sports.

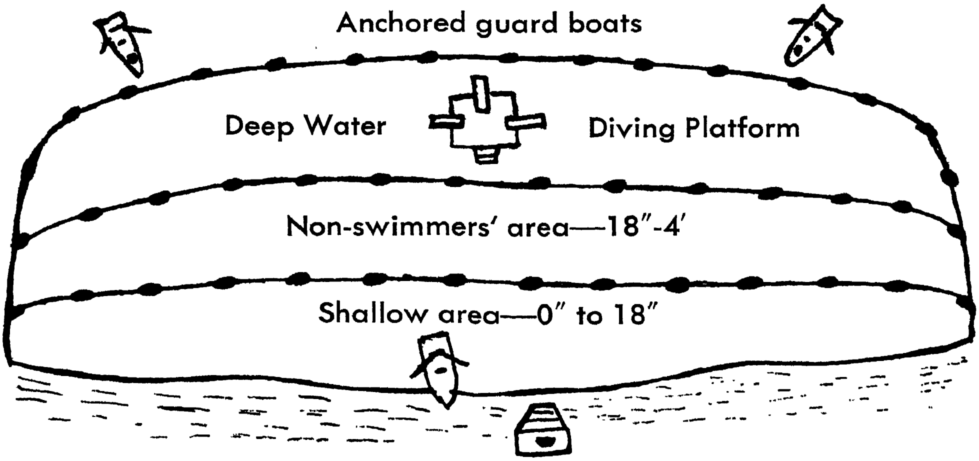
PART I

CHAPTER 1
GETTING USED TO THE WATER

The majority of people who do not know how to swim have either developed a great fear of the water, or have not had the opportunity to learn to swim. As in many other areas of teaching, there is an acute shortage of qualified teachers of swimming. And many public beaches and pools are not well marked to encourage the non-swimmer to venture into their depths.

Those who can swim only a short distance become very frightened when they find that they cannot touch the bottom with their hands or feet. All beaches should have shallow and deep areas clearly roped off, with specific areas designated for the use of all the modern swimming equipment which is now available to the public. This new equipment enhances the sport of swimming and really will help beginners to learn efficient and strong swimming strokes.

The following is a diagram of a well marked beach, which will encourage non-swimmers to enter the water and become active participants in water activities. After groups are given a little instruction and demonstration on the natural and enjoyable techniques of swimming, they practice very diligently and can learn to swim in a very short time.



A well marked bathing beach

1. Shallow area—0″ to 18″ for children under seven years.
2. Non-swimmers' area—18″ to 4′ for both children and adults.
3. Deep water area for swimmers and divers—4′ to 10′ or more.

Equipment can be allowed in both shallow areas, with the proper supervision and knowledge of the safety measures involved. A large percentage of the new water toys and inflated aids for both adults and children have safety valves which prevent the leakage of air, making them very valuable in helping everyone become active and more relaxed in the water.

There are five methods presented in this chapter to assist swimmers in getting used to the water. Two or three of these should make everyone fairly comfortable. However, it is not necessary that any of these be entirely mastered before trying to learn the first swimming stroke. Many swimmers lose their fear of water as they are actually learning movements, and become better adjusted to the water with each new skill.

The following are suggested facilities and methods which have proved to be very valuable and successful for beginners:

SWIMMING AIDS.

There are a number of these aids sold commercially. They include such things as plastic and rubber rings, frogs, water wings, swim belts and the ever-popular tire tube. All of these can be used in most swimming areas with much success. However, they become hazards when people rely on them entirely and do not take precautions in using them.

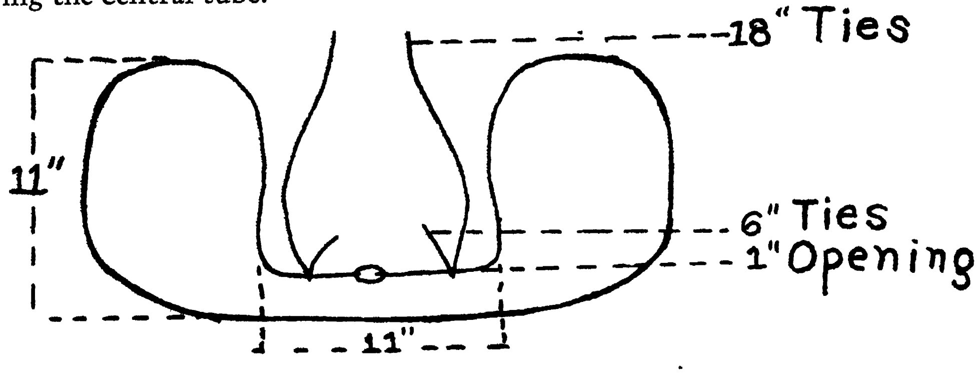
How they help the beginning swimmer: The majority of people cannot coordinate two contrary motions in the natural medium of air, and when they enter water with their natural tenseness in this medium, they are unable to learn more than one physical skill at one time. Swimming aids, therefore, allow the swimmer to concentrate on either arm pulls, or leg strokes, and then are very useful when leg and arm motions are coordinated for each swimming stroke.

Swimming aids also help the novice to float higher in the water, thus eliminating much of the breathing problem which discourages so many beginners. It is very difficult for many to concentrate on a leg or arm stroke, and maintain a position in the water for easy, natural breathing. Many people leave swimming instruction if they experience too many choking or coughing bouts, particularly if these are followed by serious ear and sinus infections. With a good swimming aid, each stroke can be learned, and coordinated with the proper timing for breathing, and **then the aid can be discarded** without very much difficulty.

Children often want to try to swim alone after they have learned partial strokes, but they can be returned to the aid, at different times, for further development of their strokes and good breath control. Progress can be determined by the parents, or instructor, and the individual desires and aptitude of the child.

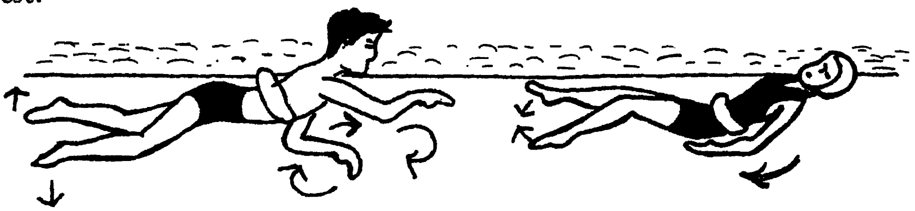
The most popular aids are swim belts, buoys, wings and rings which allow the swimmer to lie in the natural swimming position in the water. With these new safety valves, **the air can gradually be decreased in the aid** as skill and confidence develops in each swimming stroke. The very tense beginners will require the full amount of air for those first attempts.

Good swimming aids can be made quite cheaply from heavy, unbleached muslin, poplin, or any other firm textile which will hold air when it is wet. If they are sewn with a fine needle, two or more times, they are quite safe. The dimensions of the following pattern have been used for children three to seven years of age. Larger sizes can be made by lengthening the central tube.



Water wings made from a firm textile

Inflate each side of the wings separately and then tie it off firmly with the 6-inch and 18-inch ties. Then tie the 18-inch ties around the swimmer's chest.



Prone and supine positions with swimming aids

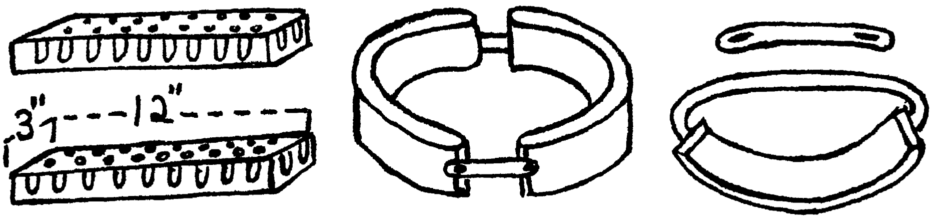
The following instructions will help swimmers in using all inflated aids safely:

1. Release the air until the body will float comfortably low in the water Tire tubes should be half deflated.
2. The **chin** should be **level with the water.**
3. **Shoulders** should be as far **under water** as possible.
4. Keep the **mouth open for breathing.**

People who prefer more solid swimming aids can purchase many types of water skiing belts and vests. Some of them, however, are too thick and bulky for free movements of the arms, and should be chosen with care. Good swim belts can be made from strips of foam rubber, 2 inches thick, 3 inches wide and from 12 to 14 inches in length. If they are encased in two layers of sealed plastic jackets and then covered with colorful sail cloth or canvas, they make very good belts for many occasions.

If the belts are made in sections that can be fastened together with adjustable buckles or buttons, each section can be used as a separate aid for the more advanced swimmers who need only a small amount of added buoyancy for developing various parts of each swimming stroke. Each section can be used in different places where it is needed, for instance: around the waist, under the head for the back or side stroke, or under the feet when concentrating on the coordination of arm strokes and breathing rhythms.

The following pattern has been used successfully with both children and adults, and is very inexpensive to make. Six two-section belts were made from one foam rubber cushion which measured 18″ x 24″ and was 2″ in thickness.

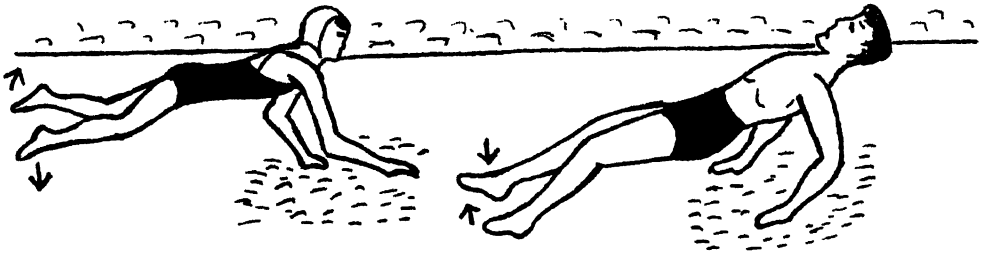


Adjustable swim belts—made from foam rubber

Many of these aids can be used very effectively in many of the swimming strokes in the following chapters when the swimmer is trying to coordinate the arm and leg motions. **Without swimming aids, many swimmers continue to flounder** for long periods and may never develop an efficient and enjoyable swimming stroke.

LEARNING BEGINNERS' POSITIONS WHILE PLACING HANDS ON THE BOTTOM OF THE SWIMMING AREA:

1. In the front lying position, place the hands on the bottom in the shallow area.
2. Straighten the body and lower the chest in the water so that the **shoulders are under water.**
3. Keep the head up and **mouth open for easy breathing.**
4. Kick the feet up and down slowly. This helps to keep them floating near the surface.
5. Turn over and do the same on the back with the back of the head resting in the water.



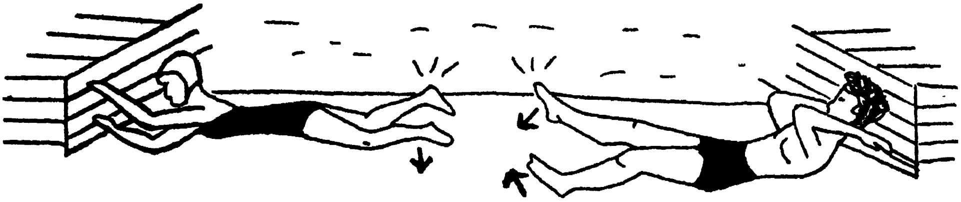
Prone and supine positions in the water

Children like to crawl around in the water with their hands on the bottom. This helps them in many ways in getting used to the movements of the water.

USING STATIONARY SUPPORTS SUCH AS A DOCK, FLOAT, EDGES OF RAFTS, POOLS, ETC.:

1. In the front lying position, place one hand above the water and the other below the surface in a good position for pushing against the support and straightening the body and legs.
2. Be sure that the **shoulders stay under water.**
3. Hold the head up and keep the **mouth open for breathing.**
4. In the back lying position, place the hands over the shoulders to grasp the edge near the surface of the water.
5. Let the back of the head rest against the edge, and extend the legs.

In these two positions, many of the swimming kicks can be practiced.

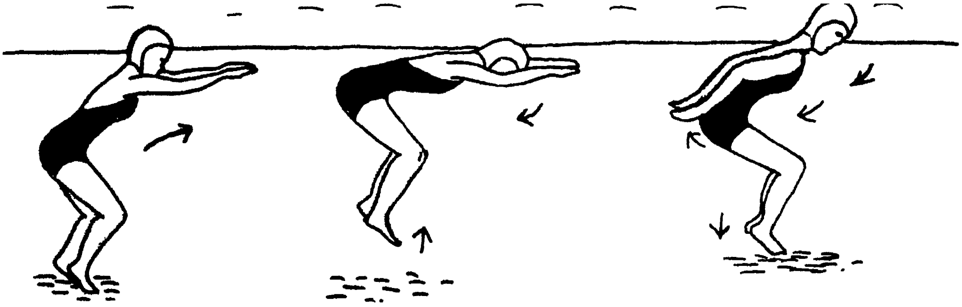


Flutter kicks while holding onto dock

The various coordinations are illustrated and described in the following chapters and include the **"flutter kick," "frog kick,"** and **"scissors kick."**

THE FACE FLOAT, COMMONLY CALLED "DEAD MAN'S FLOAT".

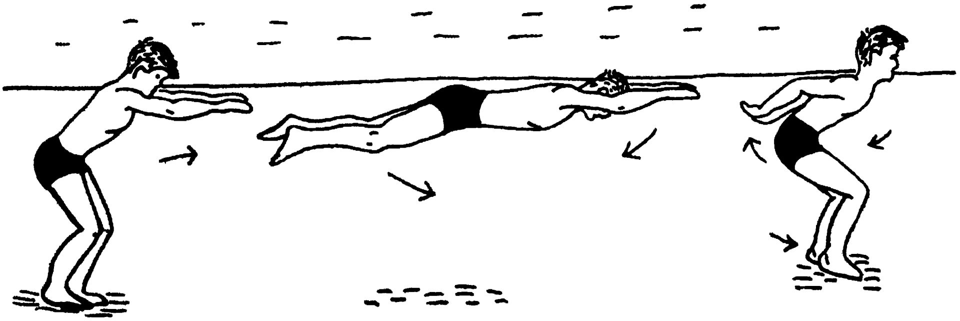
Before attempting this float, you must learn to submerge the face in water while holding your breath. Some swimmers can do this quite easily; others experience a great amount of discomfort and become so tense that they can never learn to relax in this position. They also find it difficult to concentrate on swimming coordinations. However, with much practice at various intervals, most swimmers can overcome much of the discomfort



Tucked float and regaining standing position

Children can be encouraged to go under water with such games as picking up colored stones or heavy toys; playing "Ring Around Rosie" with all falling down under the water; playing "Charlie Over the Water," and many other water games or stunts that will encourage practice in this skill. The following are the instructions for older children and adults:

1. In waist-deep water, bend over and wash the face with handfuls of water.
2. **Take a deep breath** and then bend over, submerging the face in water. When your lungs are full of air, you cannot breathe the water into your air passages, unconsciously, when your face is under water.
3. As confidence develops, squat down and completely submerge the head and shoulders.
4. When you begin to feel yourself floating, pick up your feet and float in a tucked position.
5. As skill and confidence increases, push to a full prone position for a full face float.



Face float and regaining standing position

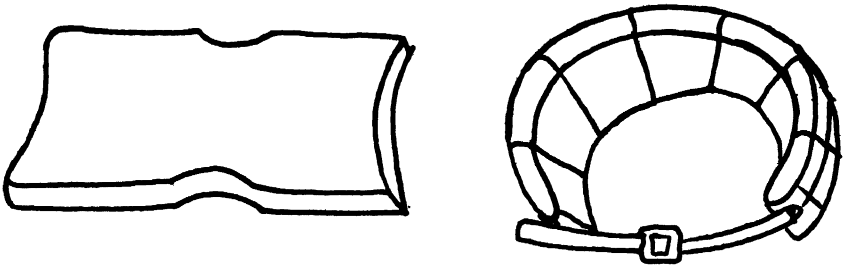
6. **Remember to take a deep breath** before each float.
7. **Lengthen the time of floating by counting to ten** or more before coming up for air.
8. **To get up, push both arms down very forcefully** toward the bottom and pull your feet under you.

For those who find this float very difficult, it is not necessary that it be learned for any of the elementary strokes presented in Part I of this handbook. Many can learn to become strong and efficient swimmers without it. However, it is necessary for learning the American Crawl or Diving.

THE KICKBOARD, A VERY VALUABLE SWIMMING AID:

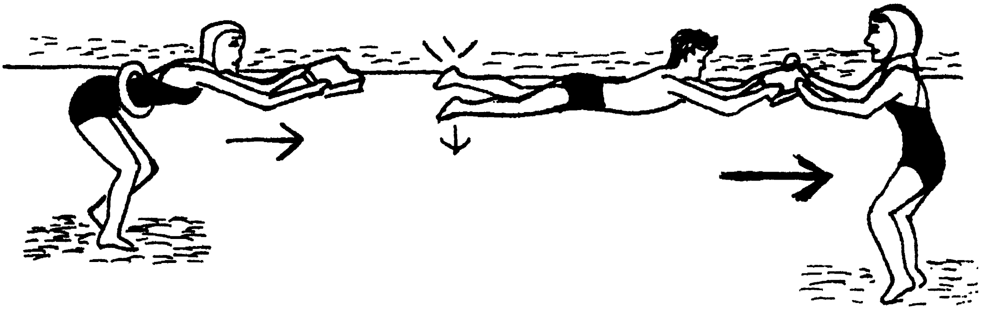
There are many kinds of kickboards now available to the public: those made of foam plastic and the light weight woods are very easy to handle and give a great deal of support to the swimmer. However, a good kickboard can be made from a balsam fir or pine plank, 10 or 12 inches wide, 2 inches thick, and approximately 18 inches long. It should be sanded and shellacked; then coated with good deck paint or varnish. There is **one precaution to take in using the heavier boards,** however. If children in their play sit on them, or force them under water too far in any way, they can slip away from them and come up quite quickly, possibly hitting a swimmer who is nearby.

The very frightened and tense individuals often will need the help of both a swim belt, or other aid, and the kickboard. With these two aids, or the aid of an assistant, they will avoid getting off balance and submerging themselves in some position from which they cannot easily recover themselves. Many people have a great deal of difficulty in learning to balance themselves when they are learning to swim. And each uncomfortable experience causes them to develop more tenseness than they already display.



Kickboard and adjustable swim belt

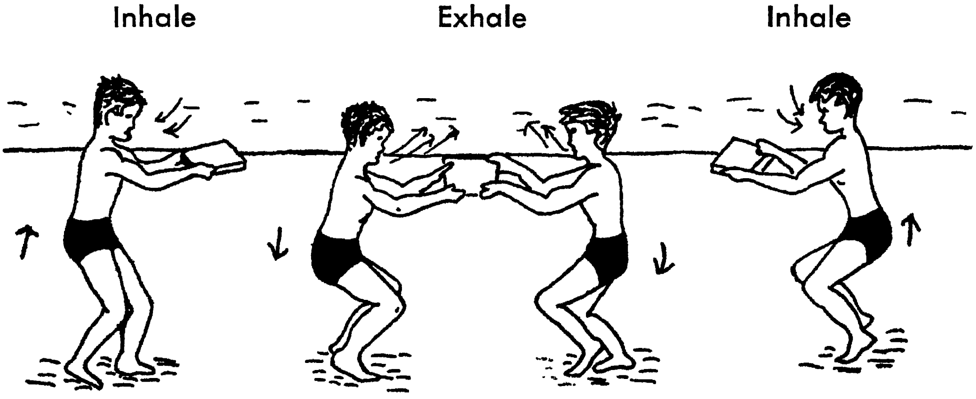
This new equipment is needed by about eighty percent of adult swimmers and a large majority of children for helping them along the way to efficient and safe swimming—the kickboards for developing strong kicks, and other aids for developing efficient arm strokes. **Learning time will also be cut in half,** or to a third, with the use of this equipment, and many can learn to swim in less than a week.



Beginners' positions with kickboards and aids

The following activities should be practiced in waist-deep water. Small children should be accompanied by parents, or an older buddy, for relaxation comes with confidence and experience in enjoyable activity.

1. With a kick board in hands, walk into water, waist deep, and jump up and down for exercise.
2. **Squat down until the water touches the chin,** and then stand again. Do this several times.
3. Squat down again to shoulder depth and practice the following **breathing exercises** with the **mouth open!**
   - (a) Breathe **in** and **out, over the top** of the water.
   - (b) Squat down far enough for some of the water to come into the mouth, and **then blow it out as you breathe out.**
   - (c) Jump up and down and regulate your breathing so that you **always breathe out** when the water comes into the face, and **in** when the **mouth is above water.**
   - (d) Do not swallow any water, or breathe in when the water covers the mouth. If you find yourself coughing or choking, you have done just that and will feel uncomfortable for a moment.



Breathing exercise

While participating in water sports, breathing should be done through the mouth because drops of water stay in the nose and can be carried into the nasal passages with every breath. Incorrect breathing is the cause of many nasal and ear disorders acquired while learning to swim.

"Over-the-water" breathing is used in all swimming strokes except the American Crawl and Butterfly Breast, which are advanced strokes and are described and illustrated in Part II. Those who master this method of breathing can easily learn the advanced rotary breathing required for the crawl and racing breast stroke.

Throughout the following chapters, you will be reminded to breathe correctly while practicing a swimming stroke. Swimming requires as much physical energy as any other sport, so do not hold your breath for too long a period. With continued practice, your breathing, while swimming, will become as natural and easy as your breathing while walking or running.

Thousands of swimmers every year become acclimated to the water, can do hand stands, face floats and many other stunts—**but they are not swimmers** and cannot swim to safety when an emergency arises. However, these swimmers can learn efficient swimming strokes in a very short time if they follow the instructions and exercises in the following four chapters. They then are well on their way to becoming safe swimmers who can help many non-swimmers.

CHAPTER II

THE BEGINNER'S CRAWL, COMMONLY CALLED "DOG PADDLE"

Swimming is locomotion in water by movements of the arms, legs, and muscles of the body. The human body is very similar to any floating object which has four paddles, and the movements of these paddles determine the speed, direction and kind of swimming stroke that is developed.

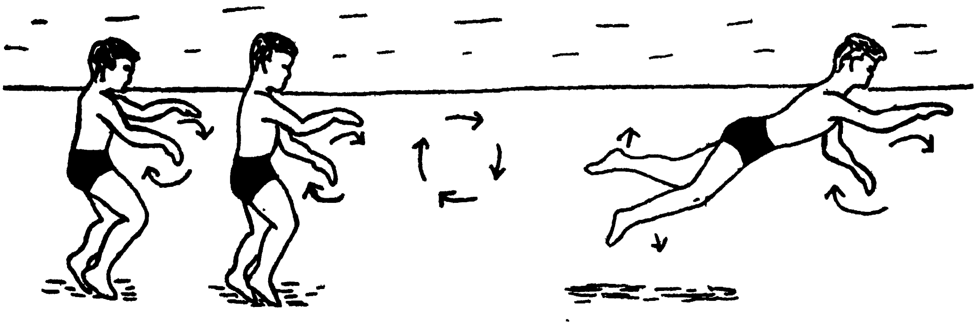
The "dog paddle" is the natural beginner's stroke which develops confidence and natural mobility in the water. Beginners instinctively try to push the water away from their faces, and strive to keep their heads above water for easy breathing. With this stroke they can keep active while they become accustomed to a horizontal position in the water, and can develop the confidence needed to progress to more efficient strokes. It also gives them the basic skill for treading water as described in Chapter V.

The following steps are just a few of the many ways a swimmer can learn this fundamental stroke. Experienced swimmers can analyze the needs of the individual cases and may need to develop some supplementary activities to help some individuals overcome their fears and inhibitions. The following exercises are helpful for the majority of beginners.

THE ARM STROKES:

Small children should be helped by someone who will actually grasp their hands and perform the exercises for them; **out of water at first,** and then in very shallow water. More confident swimmers can do the following:

1. In waist-deep water, **squat down until the chin is level** with the water, keeping the mouth open.



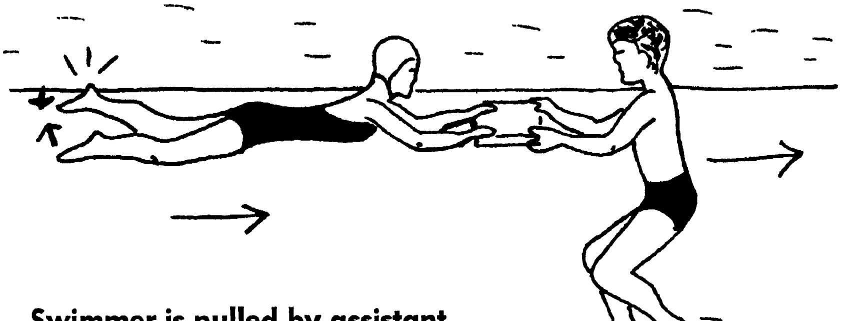
Beginners' dog paddle

2. Push the right hand out in front and **press down hard** toward the bottom and then back towards the body.
3. **Easily** bring it to the surface again.
4. Practice first the right and then the left hand, making a complete circle with each. When one hand is pressing down, the other should come toward the surface.
5. The **arms and hands stay under water** in all the movements, eliminating unnecessary splashing.
6. **Keep the fingers together** and the **hands cupped like a spoon.**

The downward motion lifts the body and feet from the bottom. The pull toward the body should make the body move forward. Do the arm strokes until you feel yourself moving forward and balancing with very little weight on the feet. Many swimmers have good buoyancy and can learn to swim the "dog paddle" without any other aids. Others will have to try all methods before they can learn an efficient stroke.

THE BEGINNER'S KICK WITH A KICK-BOARD.

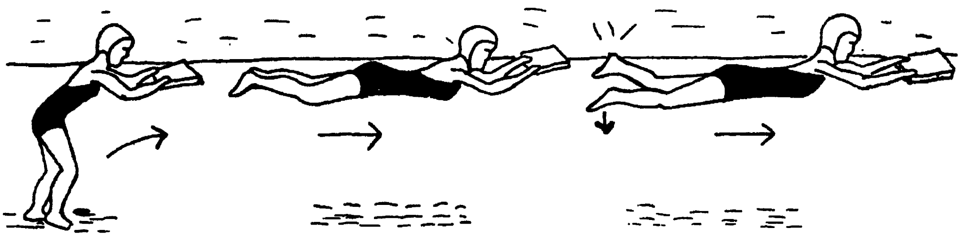
While learning this kick, **always face the shallow water,** because you move quite fast if it is done correctly. **Some beginners, who have not learned to relax, will need a buddy** to hold the board and pull them along as they are learning the kick.



Swimmer is pulled by assistant

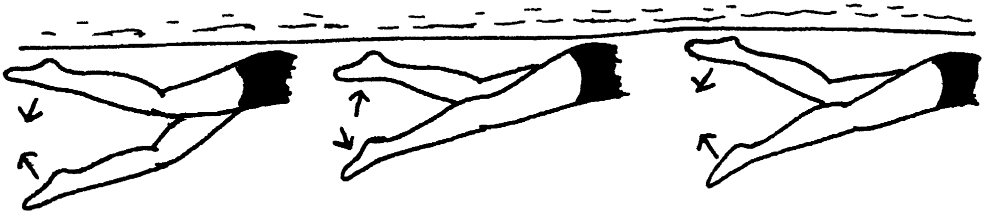
1. With a hand on each side of the board, squat down in the water until the chin touches the surface.
2. **Keep the shoulders under the water. Do not jump up** above the water because the board will sink if there is too much weight on it.

3. Lean forward and push with the feet from the bottom, in a forward, gliding motion.
4. Try it several times, pushing harder each time. You will soon feel yourself floating with the board.
5. In this easy floating position, move the legs up and down, using the entire leg from the hip to the toe.



Flutter kick in prone position

(a) The **toes should be pointed,** and slightly toed in.
(b) Bend the knees slightly, but not to right angles.
(c) **Kick** as fast as possible **with just the heels breaking the surface of** the water. If there is a great deal of splashing, the knees are bending too much.
(d) The force of this elementary kick is greater on the downward push. If you concentrate on the kick downward, the other foot will automatically come upwards at the same time.



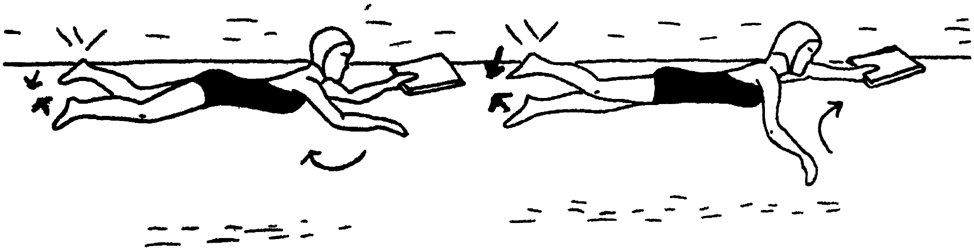
Flutter kick with kickboard

6. Practice your breathing along with the kick.
7. **To get up,** simply **push the board down quickly,** and bend body and legs to squatting position.

COMBINING THE ARMS AND THE "FLUTTER KICK".

The previous exercises with the board should have taught you to move forward with just the leg action. Now you can add one arm stroke.

1. With one hand in the middle of the board, try kicking with both feet and pulling with one arm.



Adding arm stroke to flutter kick

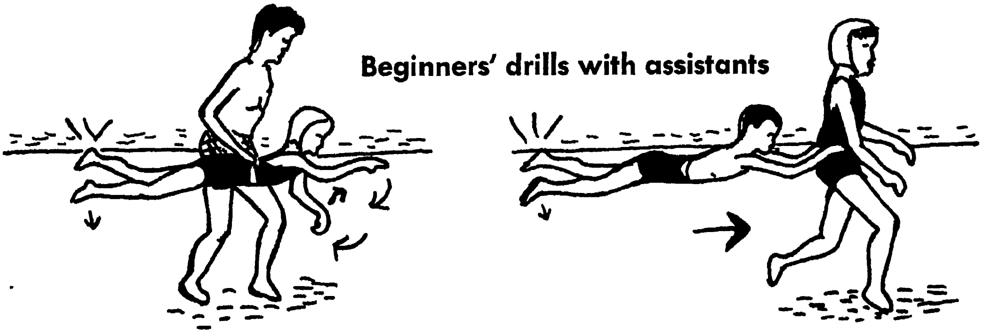
2. **Try to lengthen the stroke of that arm,** reaching it farther out in front and bringing it farther back toward the hip.
3. Alternate practice with each arm. Each arm will have to pull evenly when you go without the board.
4. As **confidence** and **skill increases,** drop the board and stroke alternately with both arms.
5. Gradually lengthen the arm strokes and try to get two kicks for each arm pull. Small children naturally fall into the rhythm of one kick for each arm stroke, **but the two-beat kick can be developed** in older children and adults.

Some well-coordinated swimmers may want to learn the overhand strokes at this time, and it is permissible. However, it is advisable that they learn the basic, restful strokes before concentrating on racing strokes. Many drownings occur because some swimmers become too tired, or too frightened, to swim the distance to safety with a strenuous, overhand stroke. When a swimmer becomes panic stricken, coordinations and breathing are very inefficient.

For those who can swim the beginner's crawl ten feet or more, with **regulated breathing,** turn to the next chapters and begin practice on the fundamentals of the side stroke and back stroke. For those who cannot swim ten feet, or at all, try some of the following methods, which should help the very tense swimmers.

COMBINING THE ARM AND LEG STROKES, WITH THE HELP OF PARENT, BUDDY, OR INSTRUCTOR.

1. The assistant places hand under swimmer's chin or body gently, just enough to give a little added buoyancy. As the swimming stroke becomes stronger, the assistant will **gradually relax the hold.**
2. Check to see if the **swimmer's shoulders are under water** and the chin is touching the surface of the water.



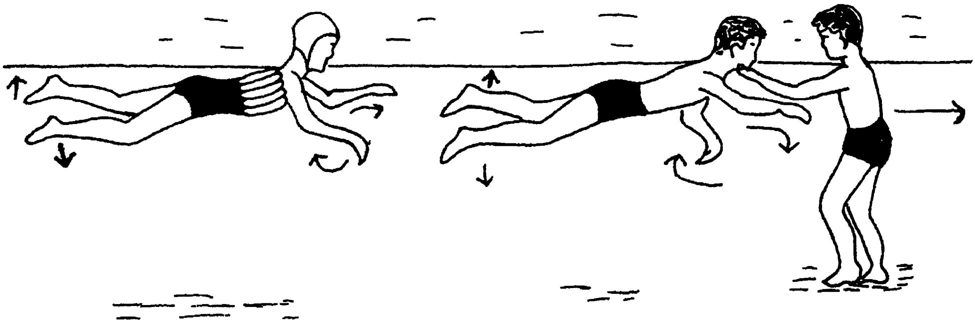
Beginners' drills with assistants

3. **The swimmer should breath with the mouth open** to help the swimmer relax, if because of extreme tenseness he has been holding his breath.

COORDINATING ARM AND LEG STROKES WITH SWIMMING AIDS:

1. Life jackets are the safest of all aids but they give too much support to the body to be useful for long periods. With one, however, arm and leg motions can be learned without fear.
2. Swim belts, water wings and swim rings allow the body to float at the natural level for swimming, and **as skill and confidence develops,** the **air can gradually be released** from the inflated aid.
3. If no progress can be made by the swimmer, he should be returned to arm stroke practice as given in the first section of this chapter.

CAUTION: Swimmers who cannot swim without aids should never be allowed into deep water with any swimming aid except regulation life jackets.



Dog paddle with swimming aid and assistant

CHAPTER III
THE SIDE STROKE, SIDE OVERARM, AND LIFE SAVING CARRIES

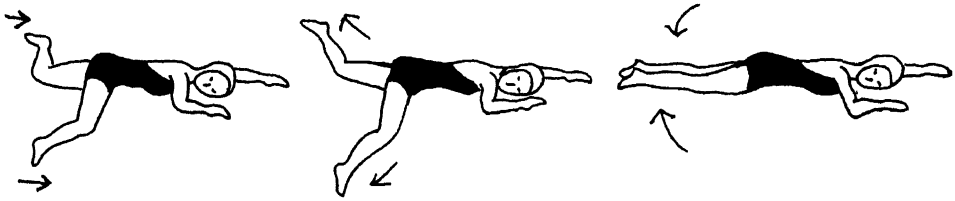
The side stroke and side overarm are restful and efficient strokes which should be learned by everyone for safety in swimming. These strokes are used by the majority of adults for distance swimming and are also the basic strokes for life saving technique, treading water and learning the trudgen crawl, an advanced stroke. Therefore, **this is one of the most important chapters of this handbook.**

If you are right handed and use your right arm and leg better than your left when participating in sports, learn to **swim on the left side;** if left handed, swim on the **right side.** The under arm in the side stroke is just a balancing paddle. The **top arm and leg really do the hard pushing** of the stroke.

Many self-taught swimmers learn their stroke on the wrong side because they feel better with the strong arm underneath them, giving them the buoyancy they need to keep their head above water. **People who learn their stroke on the correct side develop a strong and smooth stroke** and can easily learn the trudgen crawl and life saving strokes.

THE "SCISSORS KICK" OF THE SIDE STROKE:

This should be learned in land drill before it is done in water. Practice it while lying on a bench, dock, bed or other smooth surface until it feels natural and well coordinated. The following description is for right handed swimmers. Left handed persons lie on the right side and practice the same movements.



Land drill for scissors kick

1. Lying on the left side, bend the knees upward, the **right or top leg going forward;** the left, or **bottom leg, going backwards.**
2. Straighten both legs into a wide "split" position.
3. Point the toes and **snap the legs together.**

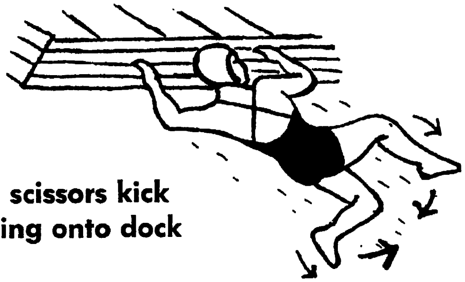
4. The exercise count is: "Easy up, then out, **hard together, and hold"!**

Keep the motions continuous and make the whole kick smooth and forceful. The **greatest push** comes on the **hard together,** but there is some force applied on the outward motion of the legs.

THE SCISSORS KICK IN WATER:

Practice it a number of times, if possible, in the side lying position while grasping the edge of a dock, float, or another stationary object. Left handed swimmers reverse the instructions.

1. **Put the right hand over-head** above the water to grip the upper edge.
2. **Put left hand under water** against the side to help push the body and legs out straight just under the surface of the water.

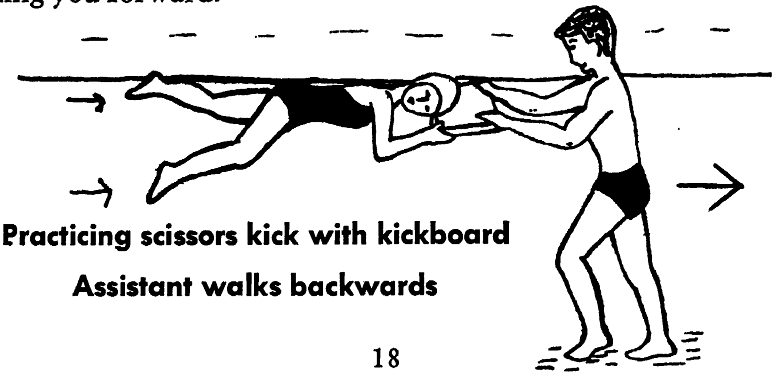


Practicing scissors kick while holding onto dock

3. Practice the kick with the exercise count until it feels strong and gives you a good push.
4. Rest the side of the head easily in the water, and **breathe out** as the **legs come up,** sometimes pushing water into the face; **in** as the **legs go together.**

THE SCISSORS KICK WITH THE BOARD.

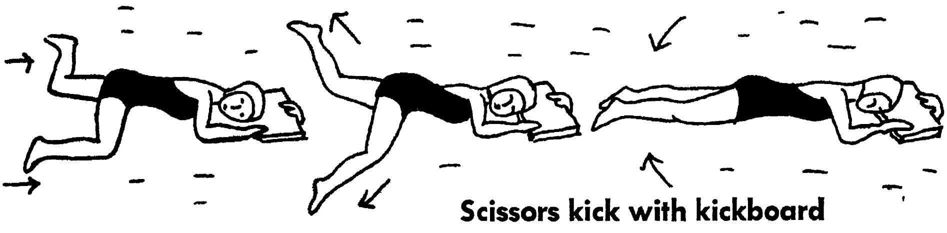
For the first few times have someone hold your board and assist you by pulling you forward.



Practicing scissors kick with kickboard

Assistant walks backwards

1. Grasp the board with left hand from under side and the right hand near the chin on the inner edge.
2. **Turn the head to the right** and bend forward until it touches the water.
3. Push from the bottom with the feet to a side float before beginning the kick.
4. **Bring the legs up slowly** and practice the kick as described previously.

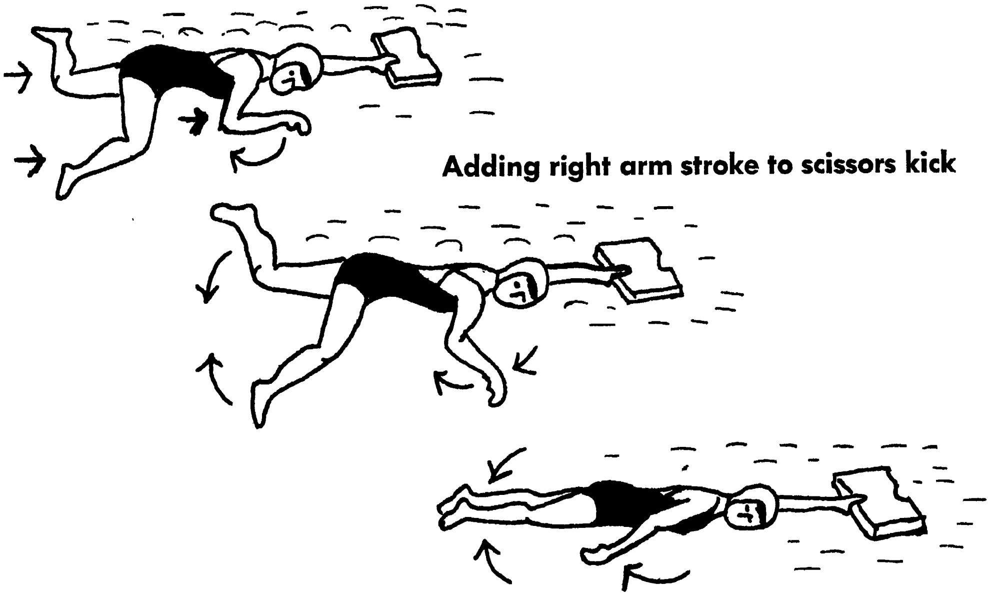


Scissors kick with kickboard

If you are having trouble in going forward, perhaps you are bringing your legs up too quickly, thus pulling yourself backwards as much as you are pushing forward. **Relax** and think about the stroke and the exercise count.

COMBINING THE SCISSORS KICK AND RIGHT ARM STROKE.

When this combination is mastered, you will travel quite a distance; so keep yourself in shallow water and learn to turn around.

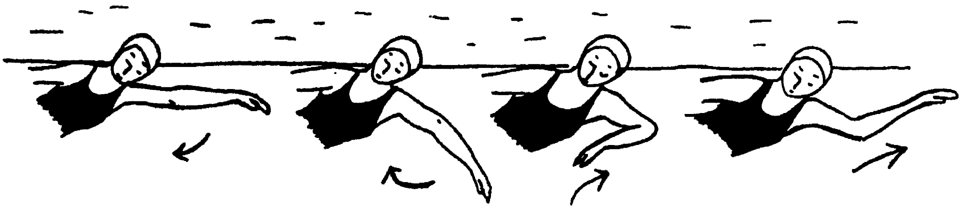


Adding right arm stroke to scissors kick

1. **The left arm extends overhead** and holds the inner edge of the board; the right arm rests at the side.
2. Turn the head to the side and push into a side float.
3. **Bring the right arm under water** to the chin as the **legs slowly come up** and separate.
4. As the **legs snap together, push the palm down and back** toward the hip with a forceful stroke.
5. **Hold the arm at the side and legs straight for a long glide** after stroking.
6. Breathe **in** as the **arm and legs stroke** and raises the head high in the water; breathe **out** when the arm recovers and lowers the head in the water.

THE LEFT, OR UNDER-ARM STROKE:

The **under-arm strokes downward** while the right arm is coming up to stroking position. Its main purpose is to keep the head from sinking while the right arm is recovering to stroke again.

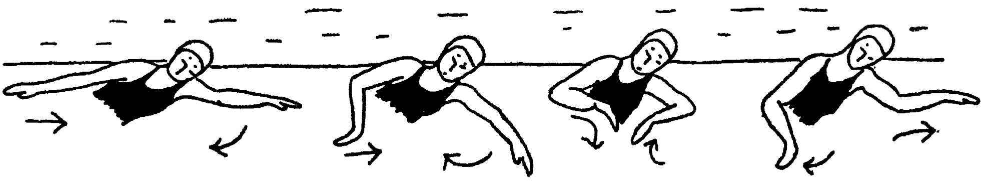


Under arm stroke for side stroke

1. Start the stroke with the arm straight over-head.
2. Push the **cupped palm down** toward the bottom and **then back** toward the hip.
3. Fold arm and hand under arm-pit and then straighten it again over-head.

COMBINING THE RIGHT AND LEFT ARM STROKES:

1. Practice with both arms while standing in shallow water, and make it smooth and natural before trying to add the leg stroke.
2. **Start with the left arm over-head** and right arm by the side.
3. As the left arm starts downward, the right arm begins to come up to chin.



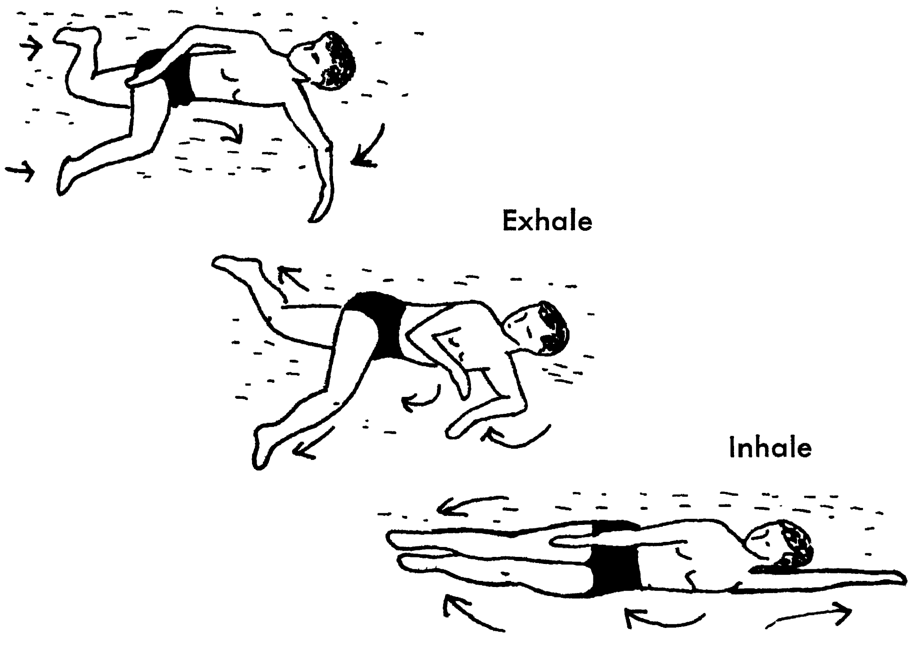
Combining left and right arm strokes

4. Count an even rhythm such as: **"Pull left, pull right, pull left,"** etc.

If you mastered the "dog paddle," you can practice your arm stroke on your side while using a weak flutter kick to keep the legs up. **Concentrate** on **forceful** and **efficient strokes** with the arms, and let the legs take care of themselves. Many self-taught swimmers never learn any better swimming strokes than this one.

COMBINING THE ARM STROKES AND THE SCISSORS KICK:

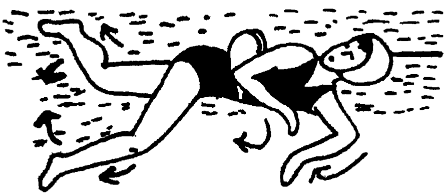
1. Start the stroke with the left arm over-head, right arm by the side, and the legs together.
2. **Take a deep breath** as you push into the side glide.



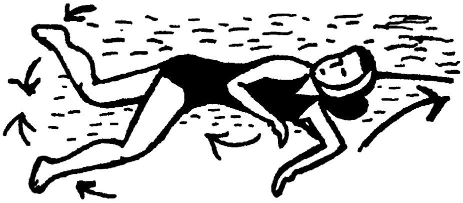
Complete side stroke

3. When the left arm starts down, the right arm and legs begin to come up **slowly.**
4. As the right arm and legs stroke, the left arm straightens over-head to start a new stroke.
5. **Hold for a good, long glide** before starting the new cycle.

Practice with water wings or other aids around the waist will allow you to concentrate on swimming coordinations without breathing difficulties. A partial aid, or one section of a divided swim belt, placed under the head keeps a swimmer in a good position for efficient breathing. Then after the stroke is mastered, correct timing for breathing can be added before the swimming aid is eliminated.



Side stroke with swimming aid around the waist



Side stroke with swimming aid under the head

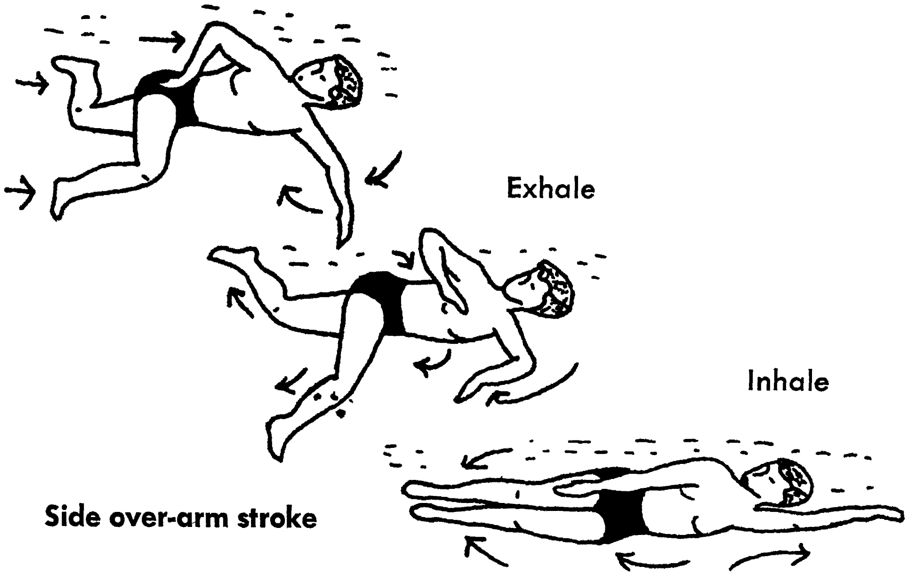
As you progress in skill and smoothness, and **swim more slowly,** you can swim thirty feet or more with ten strokes. **Learn to relax** and concentrate on efficient and smooth movements. **Breathe with every stroke** to combat both fear and fatigue.

THE SIDE OVER-ARM STROKE:

This stroke is the same as the side stroke except for one movement, namely: **raising the right, or top arm, above the water in its recovery.**

1. After the right arm strokes to the hip, bend the elbow quite sharply and raise it out of the water.
2. Carry it over the water and **reach as far over-head as possible.**
3. **Cup the hand** and push it into the water, with the fingers entering the water first.
4. **Push the right hand down and back** to the hip as the legs **snap together.**

5. **Hold for a long glide;** this is very important because the trudgen crawl can be learned very easily if you learn to relax and rest during the glide of the side over-arm stroke.
6. **Inhale** as the top arm and legs stroke; **exhale** as the same arm and legs come up, slowly.



Side over-arm stroke

Many drownings could be prevented if everyone who enjoys such water activities as boating and fishing could swim one or both of these strokes. They are not considered to be spectacular strokes, but they can carry a swimmer the distance to safety in many instances. They are also one of the most relaxing strokes of swimming.

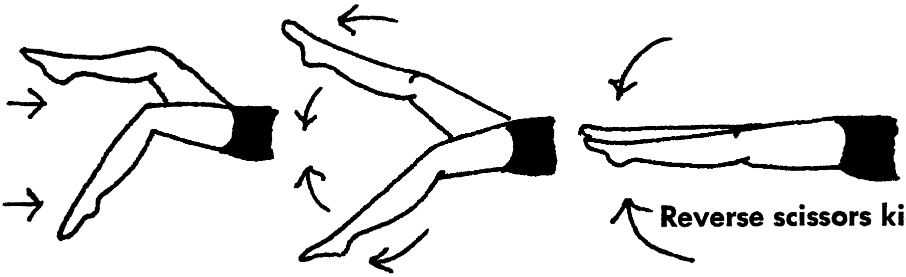
THE REVERSE SCISSORS KICK:

As the name implies, this kick is the reverse of the regular scissors kick. The top leg goes backward while the lower leg goes forward, leaving the swimmer in a partial back-lying position. It is used mostly for life-saving carries for it allows the swimmer to use a deep, forceful kick for the rescue.

If you are right-handed, follow these directions; if left-handed, reverse them and swim on the left side.

1. **Turn yourself to the right side** so that the left leg is the top leg.

2. In this position, bend the legs upward and then out, as in the regular scissors kick. The strong, **right leg will still be going forward** and the **left leg backwards.**
3. Practice it with a kickboard until the new position feels natural, and the kick becomes strong and forceful.

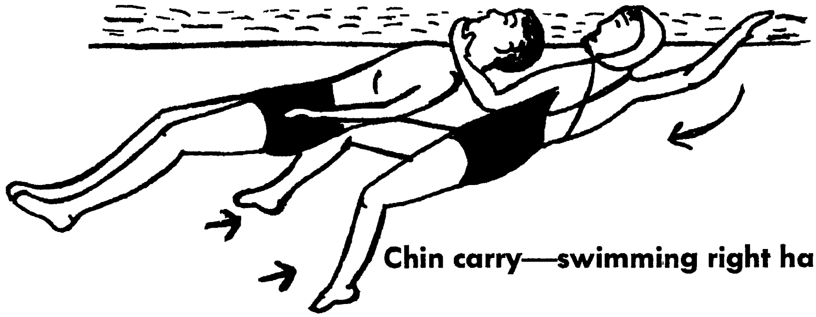


Reverse scissors kick

THE CHIN CARRY, USING REVERSE SCISSORS:

When a tired swimmer needs help over some distance to safety, the chin carry is one of the most efficient to use.

1. Have the swimmer float on his back.
2. Cup your left, or top, hand around the swimmer's chin.
3. **Press the left forearm on the swimmer's shoulder** so that the head is held firmly.
4. The right arm is then free to stroke sideways and quite deeply to keep both swimmers near the surface of the water.



Chin carry—swimming right handed

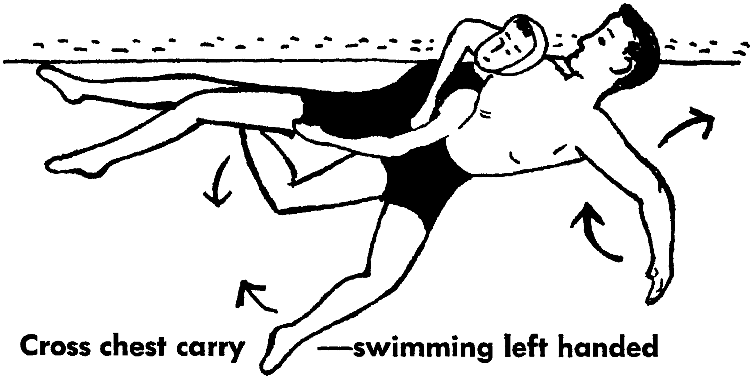
As progress is made with the stroke, and momentum is developed, both swimmers will move along at a safe rate of speed. If a good, steady pace cannot be maintained while practicing this carry with another swimmer, the swimmer should practice with the kickboard in the left hand, or with the hand raised out of water about three or four inches.

THE CROSS-CHEST CARRY:

This carry can be used under the same circumstances as the chin carry; but it also can be used **when a swimmer has become panic-stricken** and struggles with the rescuer.

Before getting the swimmer into position for the carry, the **chin carry can be used for a few strokes** to help in leveling off along the surface of the water. If the victim is unable to float on the back, then the rescuer may have to use both hands to help him acquire and maintain a supine position. The following description and illustration is for left-handed swimmers. **Right-handed swimmers swim on the right side.**

1. While **keeping a firm grip on the victim's chin** with the left hand, slide the right, or top, arm across his chest and grasp firmly under the arm pit with the right hand.
2. Turn a little to the side and swim with the reverse scissors kick, keeping the kick about four inches under the victim.



Cross chest carry —swimming left handed

3. The stroke analysis is: **kick,** then **pull** with the lower arm. While the legs are recovering, the arm is pulling, and vice versa. This progression develops a smooth, continuous stroke with very little "bobbing" of the victim, or the swimmer.

After a few strokes the victim will float nearer the surface and the swimmer can turn more to the side for a more efficient arm stroke.

These two carries, the chin carry and the cross-chest, **should be practiced by all good swimmers** to be used when emergencies arise in connection with our many popular water sports. With regard to using these carries **in rough waters,** the **cross-chest is the better** of the two; the victim can be held more securely and lifted above the waves at the same time that the swimmer strokes to keep his or her head above water.

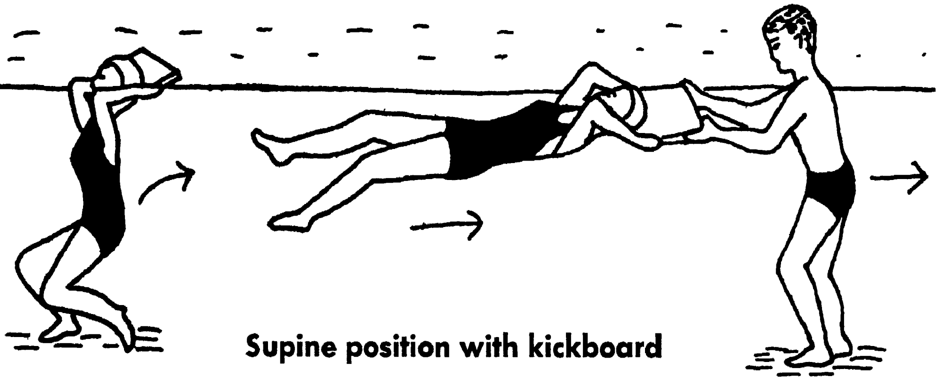
CHAPTER IV

THE ELEMENTARY BACK AND BACK SCULLING STROKES

Swimming on the back is both restful and enjoyable. Back strokes are used by many swimmers when they become tired and need to rest the muscles used in racing or distance strokes. As in the side stroke, **the body must float along the surface** of the water before you can learn the leg and arm strokes. The following can be practiced at first with someone holding a kickboard and pulling you along.

THE BACK GLIDE WITH THE BOARD.

1. Place the board back of the head and hang on it with hands over the shoulders.
2. **Squat down until the chin is level with the water.**
3. Lean backwards with head resting on the board as if it were a pillow.
4. **Slowly straighten legs, pushing from the bottom** to a back glide.
5. **To get up, have the assistant help you** by raising the board.

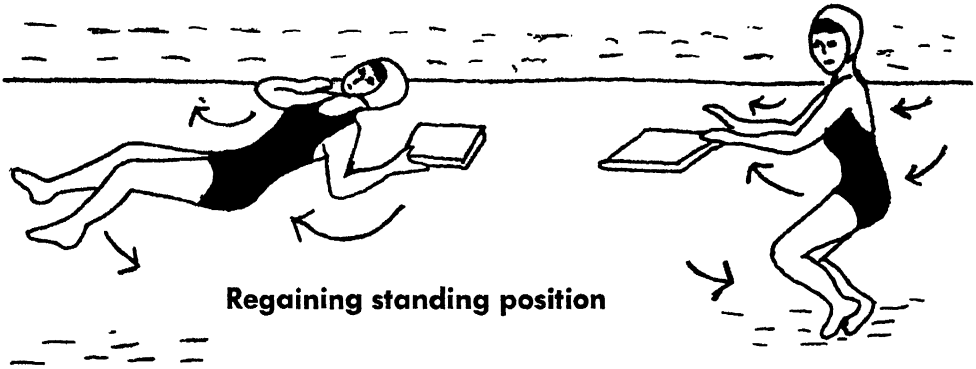


Supine position with kickboard

GETTING BACK TO STANDING POSITION WITHOUT ASSISTANCE.

1. **Let go of the board with one hand** and extend both arms sideward.
2. **Pull the chin in** and bend both knees to chest.
3. **Push arms down** and **forward** forcefully.

4. Bring hips and legs under you as you do when you sit in a chair.
5. **Hold your breath** or **blow out** as you are learning it, as water sometimes comes into the face.

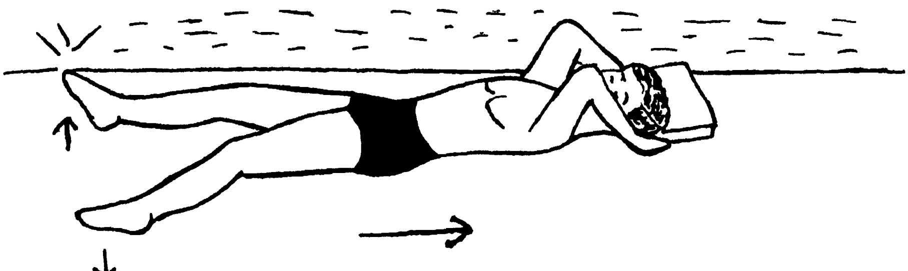


Regaining standing position

FLUTTER KICK ON THE BACK WITH THE BOARD:

This kick is not part of the elementary back stroke, but it helps you in learning to balance yourself on the back. It also raises the feet to a horizontal position.

1. In the back glide position, and holding the board, move the legs up and down.
2. Keep the toes pointed and the legs straight on the upward motion. The **knees should stay under water.**
3. Push down with the entire leg from the hip to the toes.
4. **Bend the knees slightly** at the end of the downward thrust.
5. Count an even rhythm, such as "one, two, three, four."



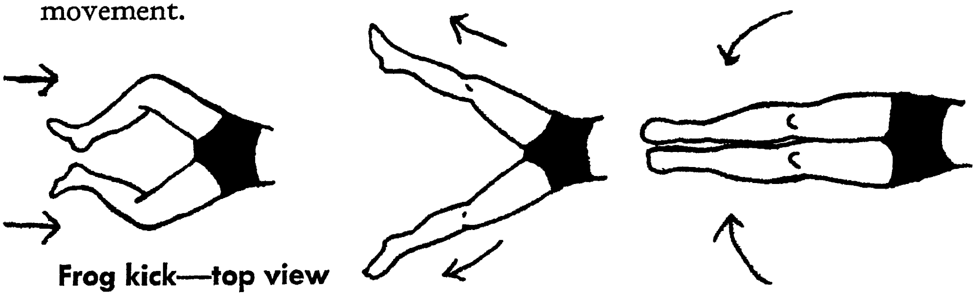
Flutter kick with kickboard

The width of the kick can vary from six to twelve inches, and the faster the legs go, the faster the body will move along the top of the water. If there is excessive splashing, either **the knees are bending too much,** or the feet are coming up too high out of the water. The body should be four to eight inches under the surface, so that most of the kick will be under water.

THE "FROG KICK" OF THE RESTING BACK STROKE.

This regular kick of the elementary back stroke is very similar to the kick that has been well perfected by frogs. Practice it first in a back resting position while sitting on the bottom of the swimming area or hanging on the edge of dock or pool.

1. **Put the heels together** and **bend the knees upward** and **outward.**
2. Spread the feet apart, keeping the ankles bent.
3. **Straighten the legs outward** and **then hard together** in one continuous movement.

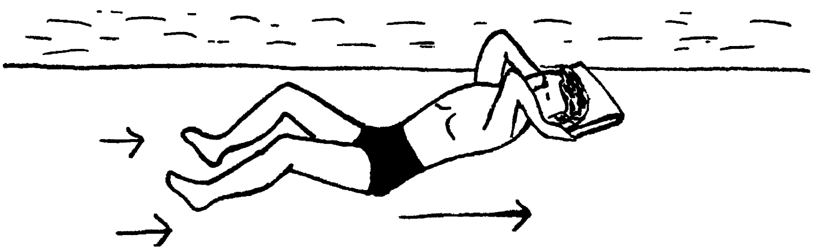


Frog kick—top view

4. Hold for one count for the glide. The exercise count is: "Easy up, then out, **hard together,** and hold!"

THE "FROG KICK" IN WATER WITH THE KICKBOARD.

1. In the back glide position, **bring the legs up slowly,** rotating the knees outward so that they will **stay under water.**
2. Straighten the legs outward, **pushing** the **soles** of the feet against the water.
3. **Snap the legs together** as hard as possible.
4. Practice the kick with the exercise count many times, resting after each stroke. Ten kicks should take you twenty feet in calm water.

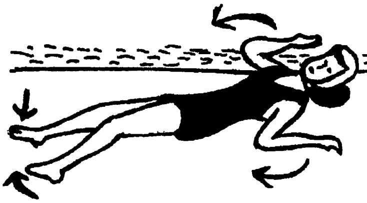


Frog kick with kickboard

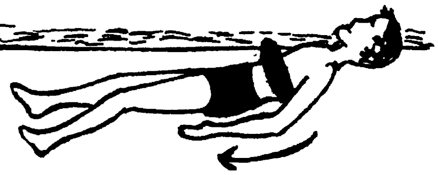
If the water comes into your face when the legs come up, you are bending the knees too quickly and not rotating them outward. The stroke should be kept smooth and relaxed.

BACK FLOAT WITHOUT A KICKBOARD:

Before you can use the arms in the back stroke, you have to learn to float on the back without any support from anything except your own buoyancy. Very tense or underweight swimmers can use swimming aids or the help of an assistant for the first attempts.



Back stroke with swimming aid under the head

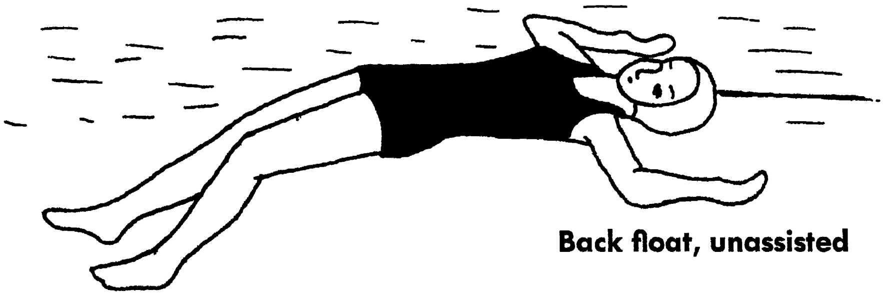


Back stroke with swimming aid around the waist

All swimmers will progress much faster if they have some help from either a swimming aid or an assistant. The back float is easy for some, but many have difficulty in relaxing in this position at first, and are unable to balance themselves in a good position for normal breathing. If help is available for learning the floating position, getting up from the supine position, and coordinating one or two back strokes, the aid can then be eliminated without too much difficulty. Swimmers who have a great amount of natural buoyancy and confidence can proceed in the following exercises without any assistance:

1. **Squat down** until the chin is level with the water.
2. **Extend the arms sidewards** and drop the head backwards until the **water covers both ears.**

3. **Take a deep breath** to fill the lungs and help you float.
4. **Slowly straighten legs,** pushing body to a horizontal, floating position.
5. **Relax with the back well arched,** and head back in water, with just the face above the surface.



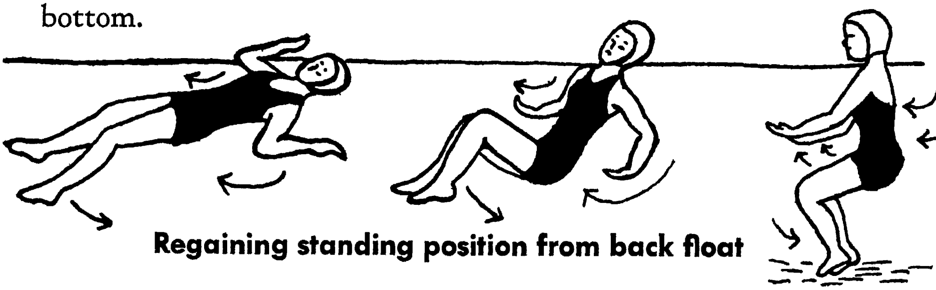
Back float, unassisted

6. If the legs do not come up easily, kick them in a gentle "flutter kick."
7. For a few times, have someone assist you in getting up by lifting your head or shoulders. **Hold your breath, too,** as water may splash into your face.

GETTING UP FROM THE BACK FLOAT WITHOUT ASSISTANCE:

After floating for a few seconds, **take a deep breath** and bring yourself to your feet by doing the following:

1. **Press palms** of the hands **down hard** toward the bottom, and then **quickly forward** in a **strong scoop.**
2. At the same time bring the head forward and bend the body at the waist.
3. Bend the knees as if you were sitting in a chair and bring the feet to the bottom.



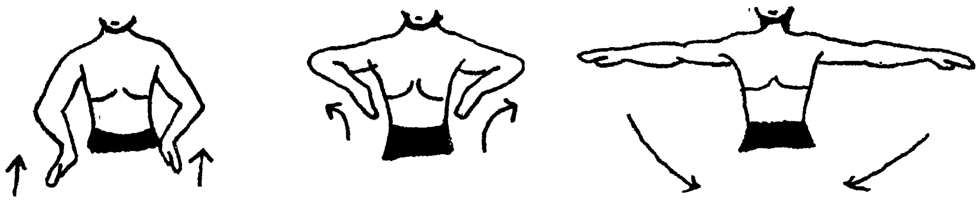
Regaining standing position from back float

THE ARM STROKE FOR THE BACK STROKE;

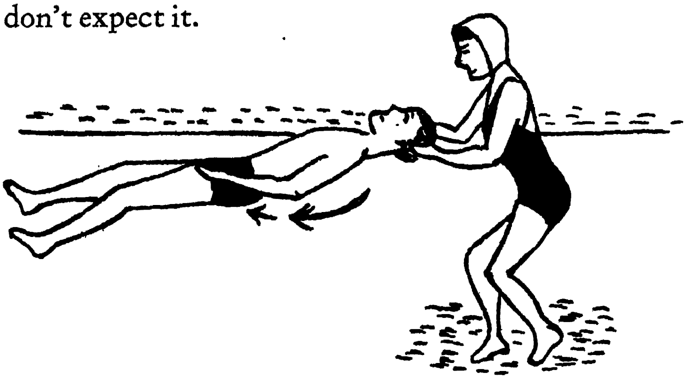
Practice the arm stroke a few times while standing up, and then try it while floating on the back.

1. The arms start from a straight position at the sides.
2. **Slowly bend the elbows** and bring hands up along the side to the arm pits.
3. Straighten arms sideward.
4. **Push arms down to sides forcefully** with the palms of the hands facing the sides of the body as they stroke.

Arm strokes for simple back stroke



When trying the arm stroke in water, be sure that the **arms stay under water** as they come to the shoulders. If they go above the surface, their weight will lower the head and shoulders and you may go under water when you don't expect it.



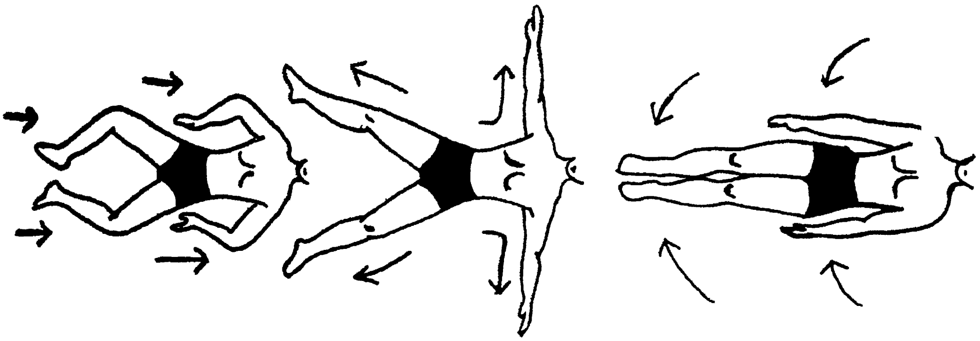
Practicing arm strokes with assistance

COMBINING THE ARM AND LEG STROKES:

The arms and legs work in unison in this easy, restful stroke, and in one complete cycle, the body will go five feet!

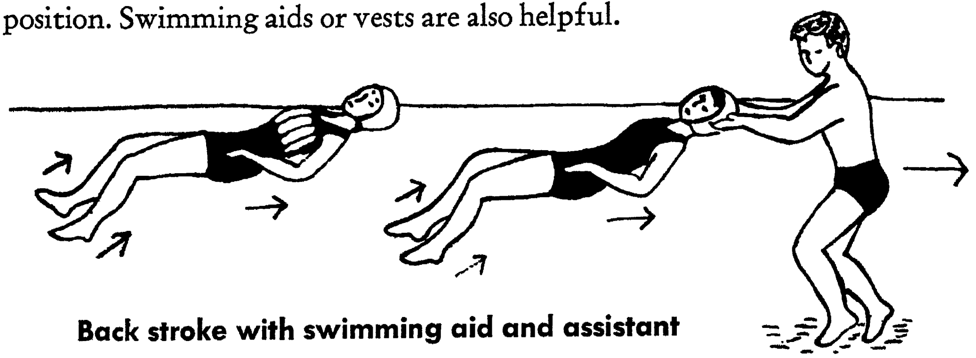
1. Float in an easy, relaxed position with the arms at the sides and the feet together.
2. **Bring the arms and legs up slowly** to count one.

3. Extend the arms sideward and legs apart on count two.
4. **Push arms down quickly** to sides and legs together on count three.
5. **Hold for a long glide** on count four.



Complete back stroke—top view

Swimmers who have poor buoyancy and occasionally go under water should practice the stroke with someone holding the head in the floating position. Swimming aids or vests are also helpful.



Back stroke with swimming aid and assistant

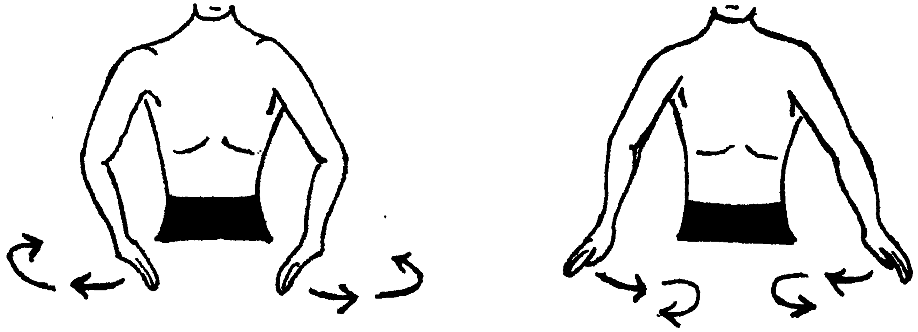
Practice the stroke until **ten strokes will carry you twenty feet or more.** Then learn how to turn to the side and swim the side stroke for a short distance. Also reverse the action and turn to the back from the side stroke. You will then have two strong strokes to use when you need them.

THE BACK SCULLING STROKE:

Sculling is done near the sides of the body by moving the hands in and out in sideward movements. The shoulders and arms rotate so that the palms of the hands can push against the water in two directions.

1. In a back floating position, start the sculling action with flexed wrists about twelve inches from the sides of the body.
2. **Push the palms toward the body,** and then turn the hand downward and out, pushing it sidewards again.
3. The **fingers should be close together** and the hand slightly cupped for efficient propulsion.
4. The width of the stroke can vary from eight to fourteen inches.

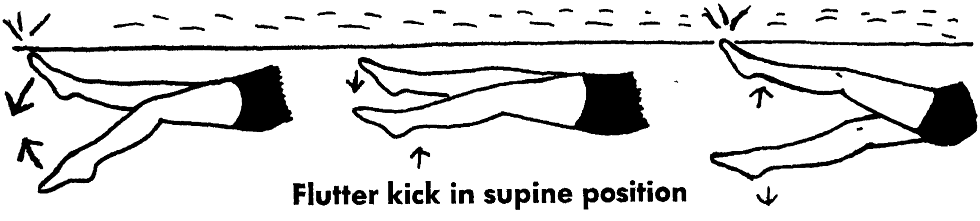
Sculling back stroke—top view



THE "FLUTTER KICK" ON THE BACK:

This is the same kick previously described in this chapter. It should be the most forceful part of the stroke and should be practiced, with or without the kick board, until it is fast and efficient. The following instructions will enable you to get a more forceful kick:

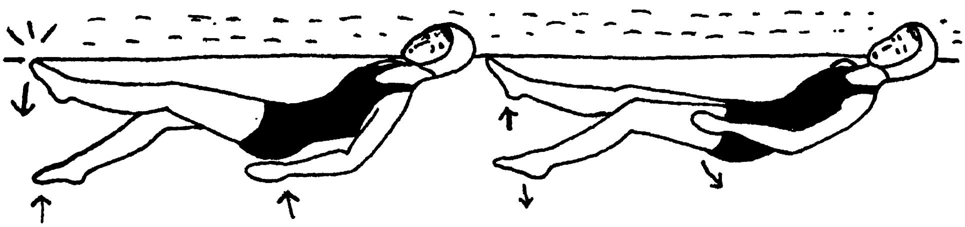
1. While keeping the toes pointed, **you can push the soles of the feet down against the water** in the downward thrust, and the **instep will press upwards** in the upward stroke.
2. Keep the hips as level as possible.
3. Pull the chin in and keep the head slightly forward for easy breathing.
4. **There should be very little splashing** above the surface of the water.



Flutter kick in supine position

COMBINING THE ARM AND LEG STROKES OF BACK SCULLING STROKE.

1. **Push into a partial back float** with the head a little higher than it is in the elementary back stroke.
2. The body floats from six to ten inches under the surface.
3. Do four or six flutter kicks to each cycle of the arm strokes.
4. **Breathing is usually very easy** in this stroke; and when the stroke is mastered, it makes the swimmer feel very comfortable in the water.



Complete back sculling stroke

Back strokes are often called the "resting strokes" and should be learned before a swimmer attempts distance swimming. They also are important for water safety when a stomach or foot cramp occurs. Their use in this respect is described and illustrated in Part III.

CHAPTER V
TREADING WATER AND SWIMMING IN DEEP WATER

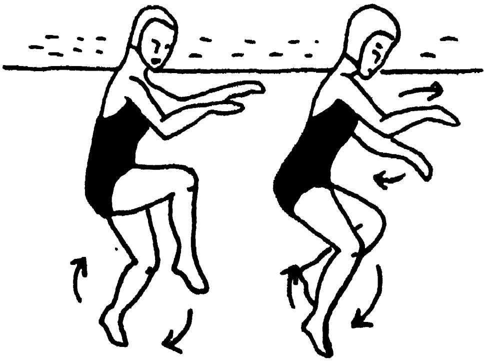
Treading water is a swimming skill which keeps the body in a vertical position with the head above water. It is used in deep water to prevent a swimmer from sinking when changing direction, disrobing, or massaging a cramp.

There are three ways of treading water. Try them all and pick the one that is easiest. Practice them first in water which is a few inches deeper than shoulder height, or near a steady object, or good assistant. Practice it often and do not swim in deep water until you are sure of one strong stroke.

THE BICYCLING TREAD:

The movements are very similar to those used in the "dog paddle" and can be practiced at first by using both the arms and legs.

1. Move the legs up and down in bicycling action, **pushing the soles of the feet down hard** against the water in alternating strokes.
2. Concentrate on the leg strokes, using the arms for balance and buoyancy.



Treading water with bicycle action

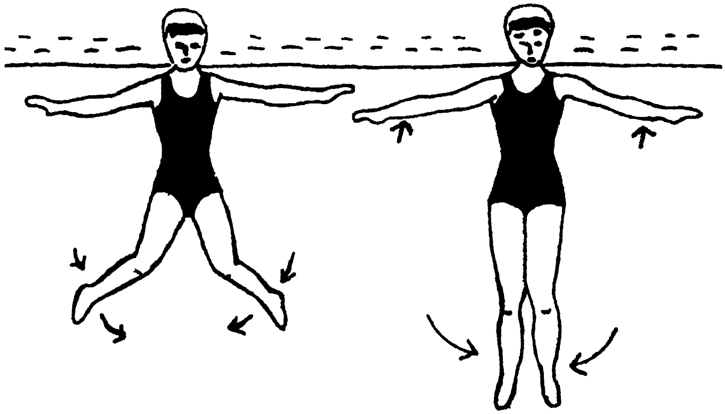
3. The head can be tipped slightly backwards as in the back float.
4. Practice the foot action until you can maintain the treading position without using the arms.

After treading water for thirty or more seconds, swim from the vertical position with the "dog paddle" or a strong side stroke.

THE "FROG KICK" TREAD:

This kick is the same as that used in the elementary back stroke and is very good in rough water. With a forceful kick the swimmer can rise above waves and continue to breathe deeply and maintain efficient strokes.

1. **Do strong, downward strokes** with the legs.
2. **Push the palms** of the hands **down** as the **legs come up.**
3. **Keep the head back** so that the mouth stays above water for easy breathing.

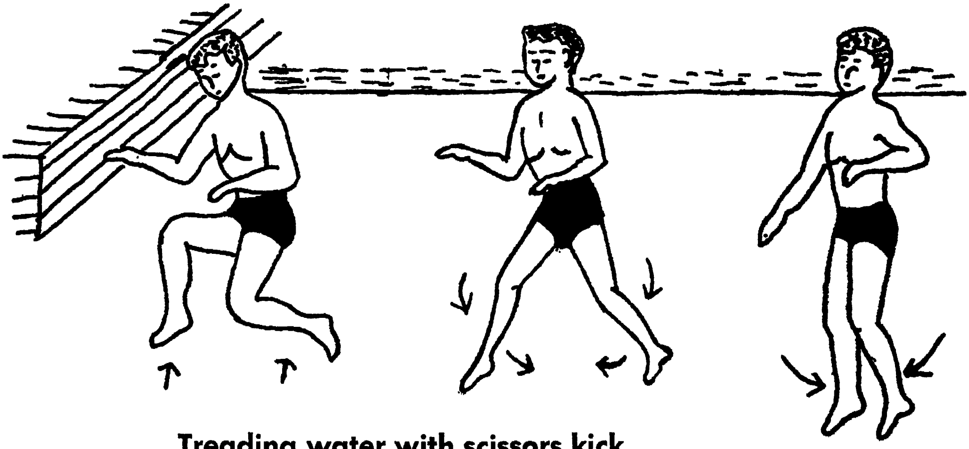


Treading water with frog kick

4. Swim from this position with a strong back stroke or side stroke.

THE SCISSORS KICK TREAD:

This is one of the most popular methods of treading water and uses the same coordinations as the side stroke. It too can be used effectively in rough water.



Treading water with scissors kick

1. **Use a strong scissors kick, pushing down** against the water.
2. The arms can be used at first to help maintain the position and keep the head above water.
3. From this position, turn the head to the side and swim a strong side stroke.

After starting to swim from any treading position, do not try to touch the bottom until you touch it accidentally. **Breathe with every stroke** to combat both fatigue and fear.

When you can tread water for thirty seconds and then swim fifty feet, with **regulated breathing,** you are a deep-water swimmer and should begin advanced swimming.

PART II
ADVANCED SWIMMING STROKES

CHAPTER VI
THE TRUDGEN AND TRUDGEN CRAWL

The trudgen and trudgen crawl are distance strokes in which both arms are alternately raised above the water in their recovery. Many swimmers use this rhythmic stroke to swim one, two and three miles without a break in the timing.

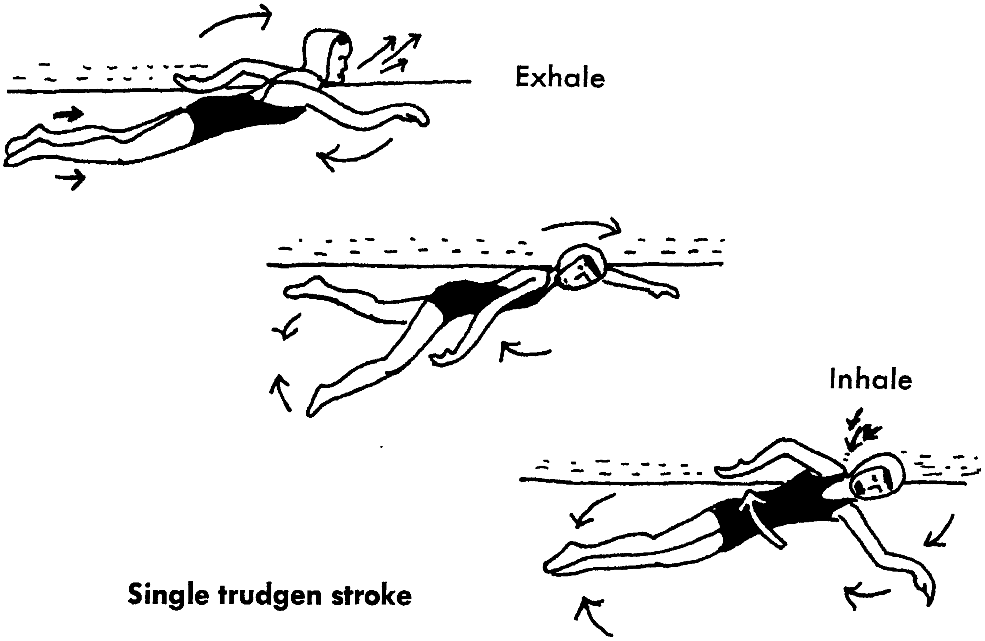
Some adaptation of the trudgen is used by about ninety percent of the good swimmers who participate only in recreational swimming. It is also the stroke most desired by people who complete the basic, beginners' strokes and want to swim an overhand stroke with the face above the water for easy and natural breathing. The majority of life guards also use this stroke for approaching a swimmer who needs help, for with it they can keep their heads above water and their eyes directly on the spot where the swimmer was last sighted. It, therefore, is being given as the first advanced stroke in this handbook.

In the single trudgen, one scissors kick is used during one arm pull, and then the feet are motionless during the alternate arm pull. Relaxed, graceful and slow movements are characteristic of the combined stroke, and are well suited to those who swim only occasionally. The following instructions have been successful progressions for the majority of swimmers:

THE ARM STROKE:

The arm stroke can be developed from the side over-arm stroke by rolling the body to a front lying position during the glide and **raising the under arm out of water** in its recovery. The following directions are given for right-handed swimmers.

1. Do several side over-arm strokes, **reaching farther forward** with the right arm.
2. **Lengthen the gliding time** and roll the body to a front lying position while raising the left arm out of water for its recovery.
3. Hold the legs straight while the left arm pulls to the hip and the right arm reaches over-head.



Single trudgen stroke

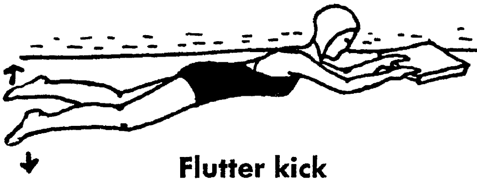
4. As the right arm begins its downward stroke, the legs begin to come up, the body rolls to the left side and the **legs do a quick scissors kick.**
5. **Breathe in** as you roll to the side and the right arm pulls; **breathe out in front** as you roll to the front lying position.
6. **Do not turn the head from side to side.** If you roll too much, your stroke is ungainly and very inefficient.

Practice this stroke until it feels strong and smooth. Ten strokes should take you thirty feet or more. If your feet have a tendency to sink during the glide and left arm pull, proceed to the trudgen crawl described below.

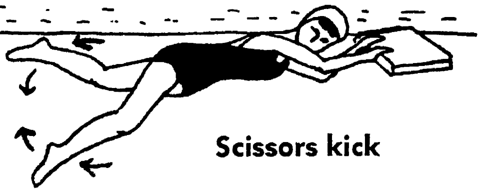
THE TRUDGEN CRAWL KICK:

This kick is a combination of one scissors kick and three flutter kicks. It can be practiced at first with the kickboard.

1. In the front gliding position, do three forceful flutter kicks.
2. Roll to the left side and **do a quick scissors kick.**
3. Lengthen the strokes and **slow them** down to an even count of 1, 2, 3, 4, 5, and 6, giving three counts to the flutter kick, and three counts to the scissors kick.



Flutter kick



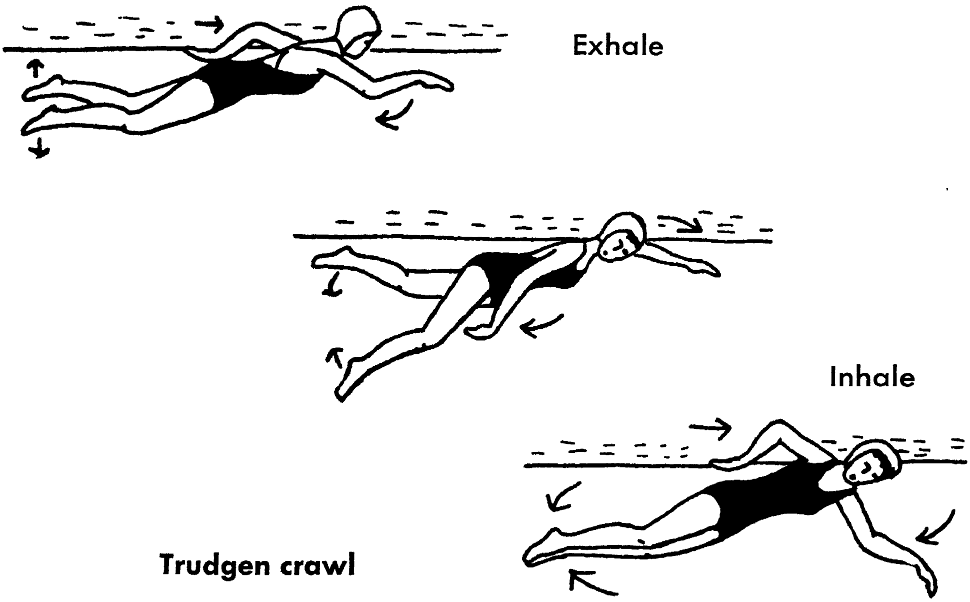
Scissors kick

4. **Inhale as the body rolls to the side** for the scissors kick; **exhale while facing front** and doing three flutter kicks.

COMBINING THE ARM STROKES AND CRAWL KICK:

The entire stroke can be developed easily if you learn to relax and slow down the rhythm of each complete cycle.

1. As the left arm pulls, do three flutter kicks.
2. As the right arm pulls, bring the legs up quickly and do a forceful scissors kick.
3. **Regulate your breathing** so that you can **take a full breath** with each stroke.



Trudgen crawl

4. **Keep the back well arched,** so that the head can stay above water for easy breathing.
5. After the stroke becomes well coordinated, concentrate on forceful arm strokes.
    (a). **Bend the elbows quite sharply** in the arm recovery.
    (b). Reach out as far as possible **over the water.**
    (c). Give a **strong pull** to each arm stroke after it begins its paddling motion.

THE DOUBLE TRUDGEN:

This stroke employs two scissors kicks in each complete cycle. Very agile swimmers can easily coordinate this stroke and go long distances without becoming tired. Those who can swim a side stroke on either side can coordinate the double trudgen quite easily.

1. With each arm stroke, do a scissors kick.
2. **The kicks have to be narrow and quick,** with very little rolling of the body.
3. The back has to be well arched if you want to keep the head above water for "over-the-water" breathing.
4. Reach as far over the water as possible with each arm and eliminate all unnecessary splashing when the hand enters the water.

After much practice, the trudgen and trudgen crawl can be done with the head and shoulders remaining in the front facing position throughout the whole cycle.

In the next chapter, **rotary breathing** is described and illustrated and can be used in the trudgen crawl if desired.

CHAPTER VII
THE AMERICAN CRAWL

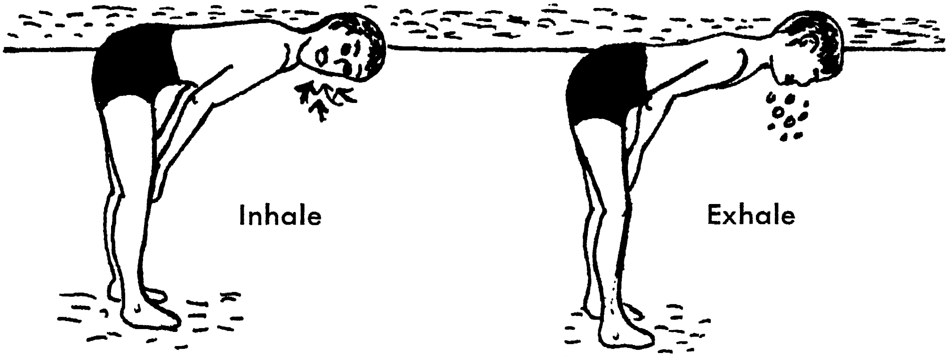
The American crawl is the fastest swimming stroke known to mankind and is used mostly in competitive swimming for short, fast sprints. It is, however, used by some distance swimmers who have practiced diligently to develop the required skill and endurance. Almost everyone admires the stroke for its grace and smoothness when it is done correctly, and most athletes desire to swim it well, even if they are not planning to enter competition.

The first step in learning the crawl is to review, or learn, the face float, (dead man's float) which is described and illustrated in Chapter I. After this is done, a swimmer can practice each part of the stroke separately, namely: the arm stroke while standing in shallow water, the flutter kick with the kick board, and the rotary breathing which is required in this stroke for keeping the body in a high and level position in the water. Many swimmers find that rotary breathing is very unpleasant at first, but with practice at various times and with conscious effort, it will feel as natural as many other phases of swimming.

The American Crawl requires a great amount of energy when used for racing; therefore rotary breathing is given as the first step in learning the crawl. All swimmers must learn to obtain as full and complete breaths of air as possible in order to maintain a good rate of speed and efficiency. For those who like to swim under water and are quite accustomed to water at this time, the following instructions can be followed with good progression.

ROTARY BREATHING:

1. Stand in waist-deep water and bend over so that the face can be submerged in water.
2. **Take a deep breath** and then submerge face under the surface.
3. **Exhale through the mouth under water:** this will take almost as much force as it does to blow up a balloon.



Rotary breathing in shallow water

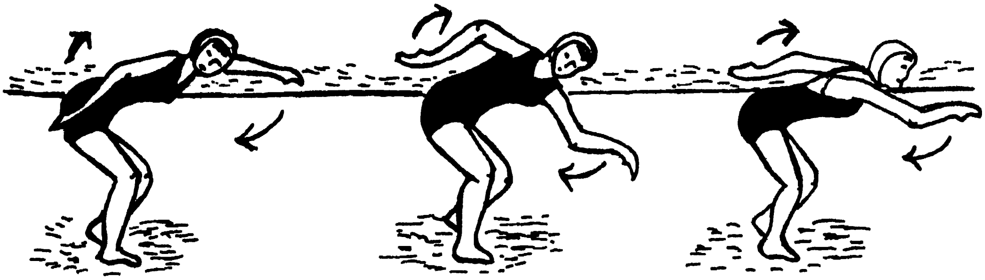
4. Turn the head to the right side, if you are right-handed, and **inhale with the mouth open!**
5. Roll face back into water and exhale again.

Practice this breathing until it feels easy and natural. Do not raise the entire head out of water to inhale, as it should always be in a straight line with the back. Likewise, the head never completely submerges; it is usually half out of water.

THE ARM STROKE:

The arm motions are the same as those used in the trudgen crawl, but if you are learning the American crawl first, the following are the instructions for those who breathe on the right side.

1. Bend over from the waist and extend the left arm overhead.
2. Extend right arm in back with palm facing upward.
3. Stroke downward with left arm and bend elbow of right arm as you bring it up and forward. Concentrate on extreme lift from the shoulder for the upper arm as it goes over the water.



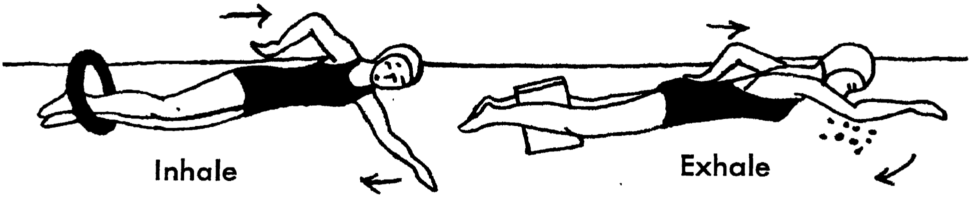
Arm stroke in shallow water

4. As left arm goes down and backward, the right arm extends overhead with the palm facing the surface of water.
5. **Keep the shoulders as relaxed and flexible as possible.**

After practicing the arm strokes in a standing position, practice the same while doing a face float. Keep the body in a front gliding position with as little roll of the shoulders and hips as possible.

COMBINING THE ARM STROKE AND BREATHING:

1. Start with the left arm over-head and right arm in back.
2. **Take a deep breath** and start the left arm downward; at the same time the right elbow begins to bend upward.
3. **As the right arm goes forward,** submerge the face in water and **exhale.**
4. As the right arm strokes and the left arm is recovering, turn the face to the right and **inhale.**
5. After a few practices, try the same in the face float position.
6. Keep the hips as level as possible. Practice with a board held between the knees will help to check the rolling. Water wings or tubes are also helpful in keeping the feet and hips steady.



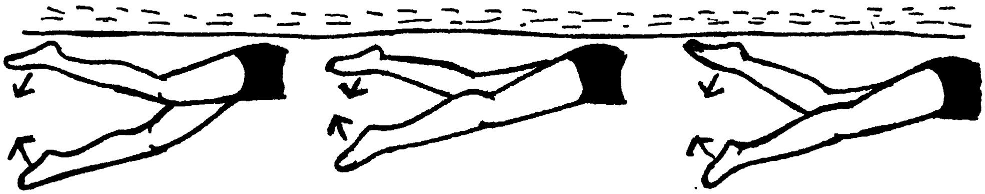
Coordinating arm stroke and rotary breathing

THE CRAWL KICK:

This is the same "flutter kick" used in the elementary stroke, but it should be practiced until it is fast and forceful. Practice it with a kick board until you go forward at a good speed.

1. **Point the toes** and use the entire leg from the hip to the toes.
2. Make the kick as wide as possible.

3. **Bend the knees slightly** at the top of the stroke, making it possible to kick down forcefully.
4. **Count an even beat,** making each leg stroke as efficient as the other. The most popular rhythm is a six-count beat, but some swimmers like a four or eight-beat kick.



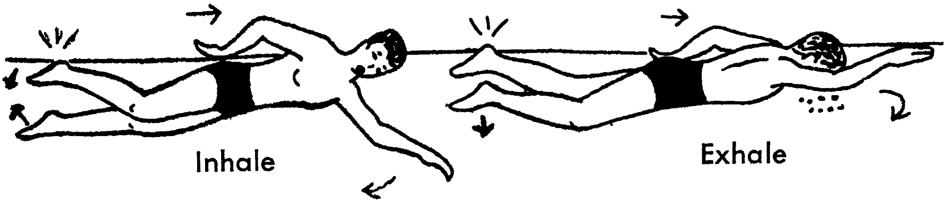
Flutter kick for American crawl

If you do not move forward with this kick, you are either bending your knees too much, or keeping the legs too stiff for good propulsion. Remember to keep the toes pointed so that the instep pushes down against the water on the downward stroke, and the sole of the foot pushes against it on the upward stroke. However, the ankles should always be relaxed.

THE COMPLETE STROKE:

If the arm and leg strokes have been coordinated well, it is not too difficult to combine them. Practice them first without adding rotary breathing.

1. Go into a face float and start a downward stroke with one arm.
2. Do three flutter kicks as that arm is stroking, and then stroke with the alternate arm, adding the other three flutter kicks.
3. **Count an even beat with each arm stroke.**
4. **Keep the hips as level as possible,** making the flutter kick efficient and forceful.
5. With practice you can do five or six complete strokes without breathing.
6. When the stroke becomes smooth and relaxed, **add rotary breathing with every stroke.**



Complete American crawl

The American crawl will carry you forward at quite a speed, but it consumes a great amount of energy. When practicing all three parts of the stroke together, namely: the kick, the arm stroke and breathing, concentrate on good breathing and then work on speed and endurance. A great many drownings occur among advanced swimmers because they have gained speed and distance in their stroke, but have failed to perfect efficient breathing. Lack of oxygen will cause swimmers to "black out" and become victims of exhaustion.

Short gasps of air may supply enough oxygen for survival but do not give sufficient exchange of gases to maintain a high degree of physical energy. Incomplete breathing charges the blood with an excess of toxins and poisons which ultimately causes the suffocation.

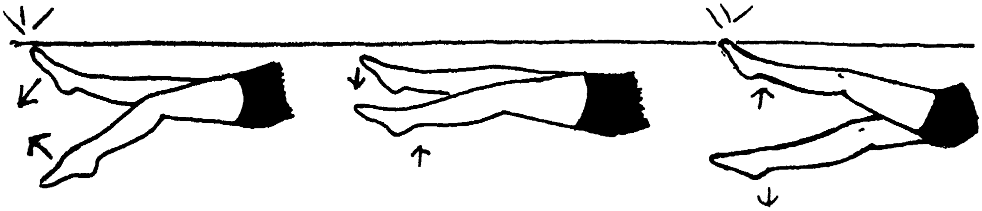
With a great deal of practice, all three parts of the stroke will become efficient and smooth and can be used in competitive swimming as well as distance swimming.

CHAPTER VIII
THE RACING BACK STROKE

This is the companion stroke to the American crawl and is used by competitive swimmers for both short sprints and distance swimming. It uses a different group of muscles than the American and trudgen crawls, and so is sometimes used as a rest stroke while maintaining a fast speed.

THE "FLUTTER KICK" IN BACK FLOAT POSITION:

This is the same kick which is described in Chapter III and is used in the back sculling stroke. However, it will need much practice with a kickboard for developing speed and efficiency.

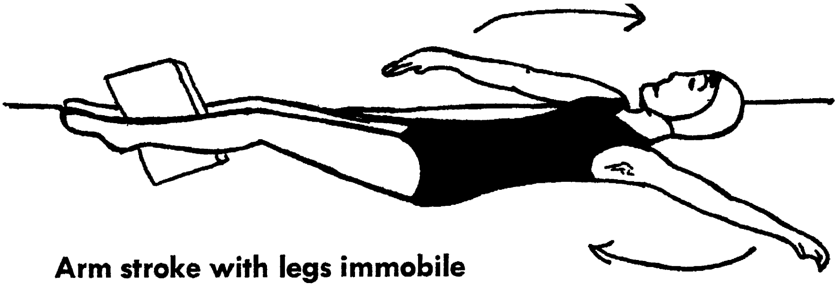


Flutter kick for racing back stroke

THE ARM STROKE:

The arms make a complete circle in reverse rotation and can be slightly bent, or completely straight. Practice the arm strokes a few times while standing out of water. You may feel like a windmill, but it will stretch the shoulder muscles, making the stroke more efficient in water.

1. In the back gliding position, bring one arm up from the side, over the body and straight over-head.
2. **Rotate the shoulder** so that the palm faces the water and the fingers can enter the water first.
3. As the first arm starts its downward stroke, the other begins to come over the body.
4. **The stroke should be as deep and close** to the body as possible. However, many swimmers develop an efficient stroke with the hand only a few inches under the surface and use the straight-arm stroke and recovery.

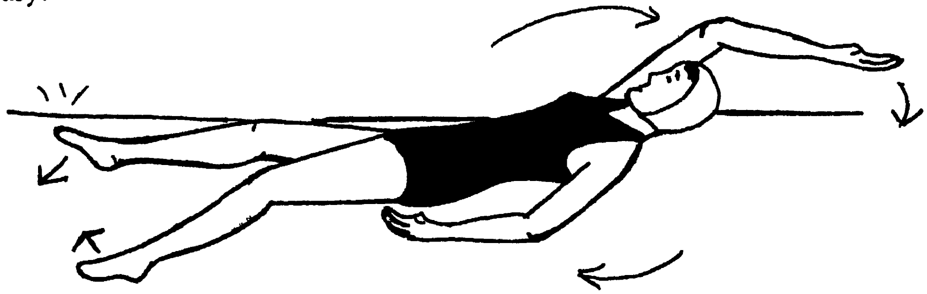


Arm stroke with legs immobile

5. Use a swim ring on the feet, or a kick board between the knees to check excessive roll of the hips.
6. **Keep the chin in** and the head tilted forward.
7. **Breathe regularly** as it is quite tiring when used for racing.

COMBINING THE ARM AND LEG STROKES:

If the arm and leg strokes have been practiced separately so that they have become relaxed and well coordinated, the combined stroke should be easy.



Complete racing back stroke

1. **Develop an even rhythm** of either a four- or six-beat kick to each complete arm cycle.
2. The kick should be quite low in the water and is most effective when there is very little splashing.
3. Keep the arms and shoulders relaxed in their recovery.

This stroke is most popular among the young adult groups of swimmers and is usually perfected by those wanting to enter competition. It is not particularly adaptable to distance swimming in rough water; however, it is popular in aquatic shows and formation swimming and adds variety to any swimming program.

CHAPTER IX

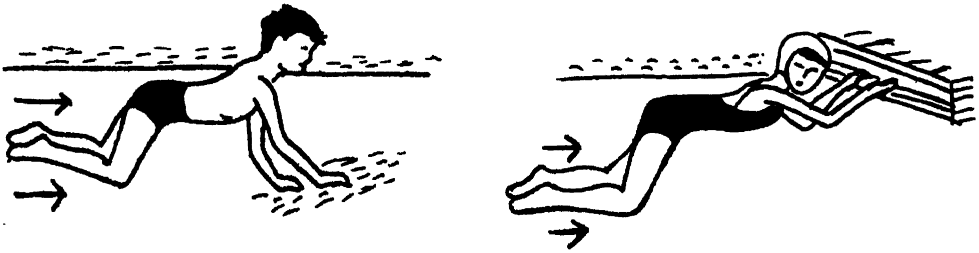
THE BREAST AND BUTTERFLY STROKES AND TIRED SWIMMERS' CARRIES

The two breast strokes are very popular among adult swimmers and have proved to be very adaptable to formation swimming. They are also very useful in helping other swimmers who have become too tired to swim the distance to safety.

Most self-taught swimmers develop an efficient arm stroke, but have neglected to perfect a strong kick. Therefore, the kick is being illustrated as the first step in learning the stroke.

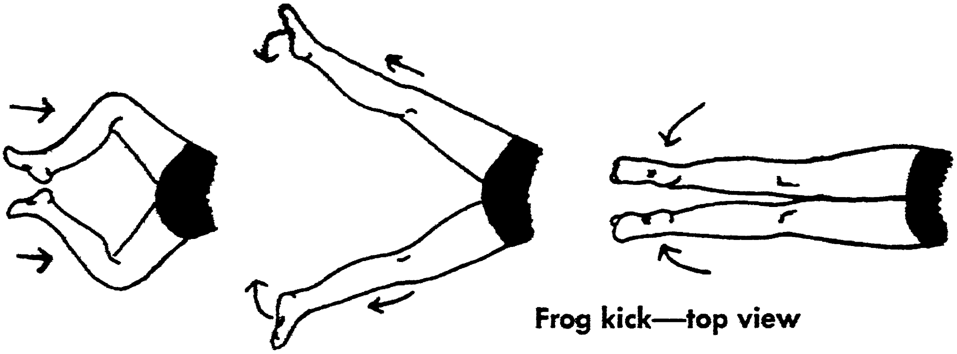
THE "FROG KICK" IN PRONE POSITION:

This is very similar to the kick which is used in the elementary back stroke, but it can be more forceful in the prone position. Practice it many times while resting the hands on the bottom of the shallow swimming area, or edge of dock or pool.



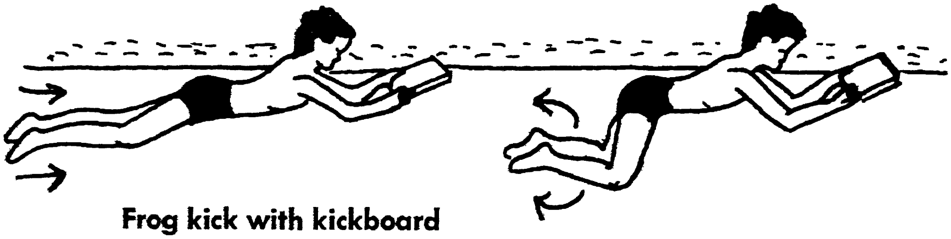
Frog kick in prone positions

1. Rotate the knees outward while bending them upward.
2. **Straighten the legs forcefully,** pushing the soles of the feet against the water.
3. Continue the stroke by **forcing the legs together.**
4. **Hold** for a moment **for a good glide.**
5. Keep the head up and breathe naturally with the mouth open.
6. **Keep the shoulders under water.**



Frog kick—top view

7. The exercise count is: "**Easy up, push out** and **together,** and **hold!"** When the coordination is learned so that it feels forceful, practice it with the kickboard until it pushes you forward with a definite thrust.
8. **Keep the back well arched.**
9. Remember to breathe regularly.



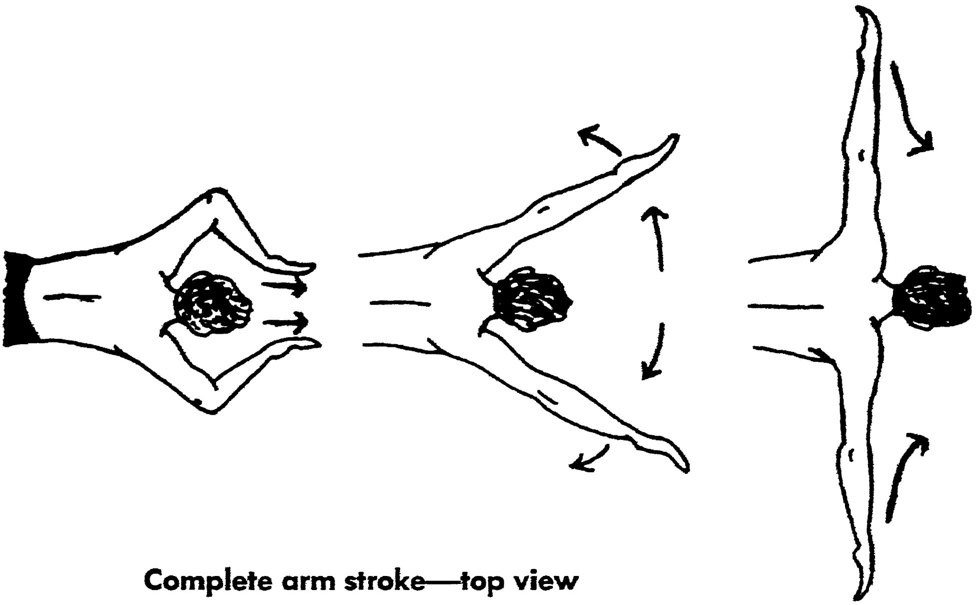
Frog kick with kickboard

The kick of the breast stroke should be as strong as the arm stroke. Some swimmers will not be able to master the kick until the entire stroke is learned. **Practice at different intervals** is often much better than continuous effort.

THE ARM STROKE:

Practice this while standing in shallow water and thoroughly learn the motions before trying to swim unassisted.

1. Push both arms straight out in front under the surface.
2. Turn the palms outward and push them sideward to shoulder level in a **forceful stroke.**
3. Bend elbows and bring hands under the chin.
4. Extend arms straight over-head again.



Complete arm stroke—top view

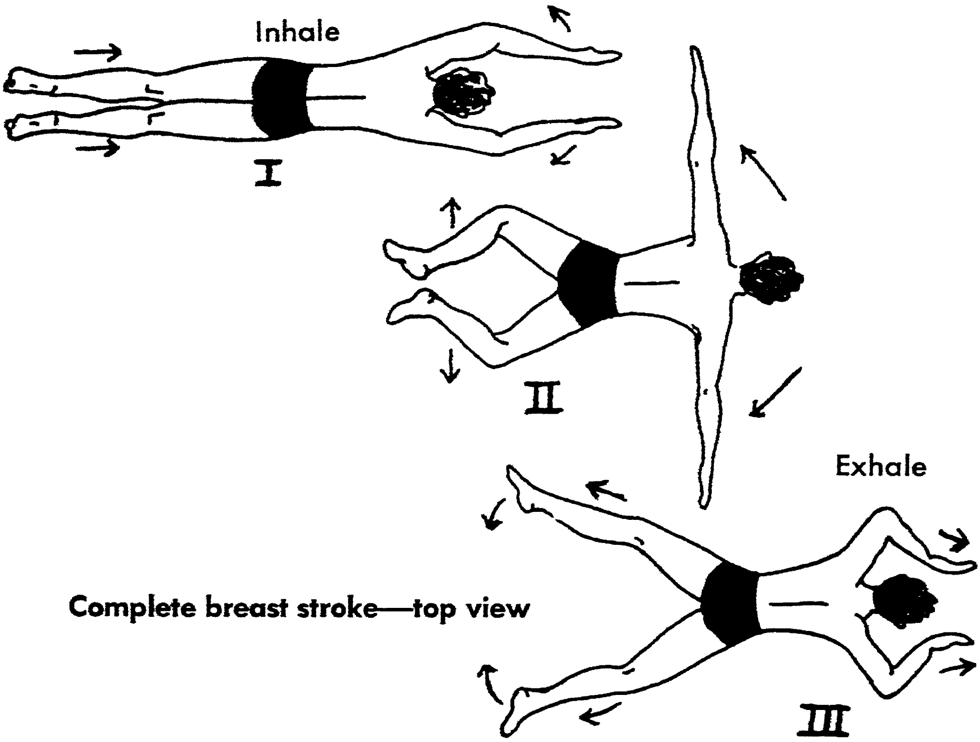
5. **Breathe in** when the **arms are stroking; out** when they are **recovering.**

COMBINING THE ARM AND LEG STROKES:

Coordinating this stroke is difficult for some swimmers, easy for others. It is the only stroke in which **the arms and legs stroke at alternate times.** A good rhythm to practice is described by the words: "First your arms, then your legs," and repeat.

1. Start the stroke from a front glide position with arms straight over-head.
2. As you push them sideward, begin to draw the legs upward.
3. Then as you bend your arms under your chest, straighten the legs outward, **pushing the soles of the feet against the water.**
4. Continue the stroke by **snapping** the legs together and extending the arms over-head. The whole body then is in a straight line for a smooth glide.
5. **Inhale** while the arms are stroking; **exhale** in their recovery.

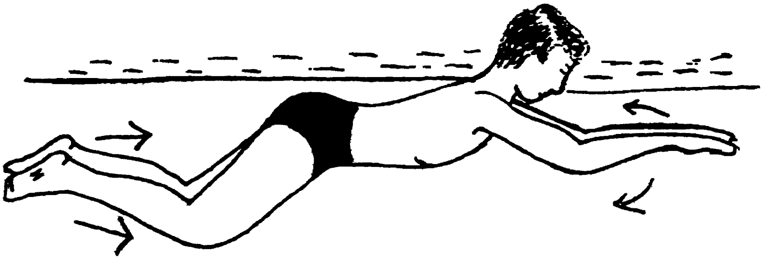
Breathing can be done "over-the-water," or the swimmer may submerge the face to exhale under water during the arm recovery.



Complete breast stroke—top view

Swimming aids can be very helpful while you are concentrating on the actual movements of the stroke. They will assist you in maintaining an easy, arched position so that you can learn a smooth and relaxed stroke.

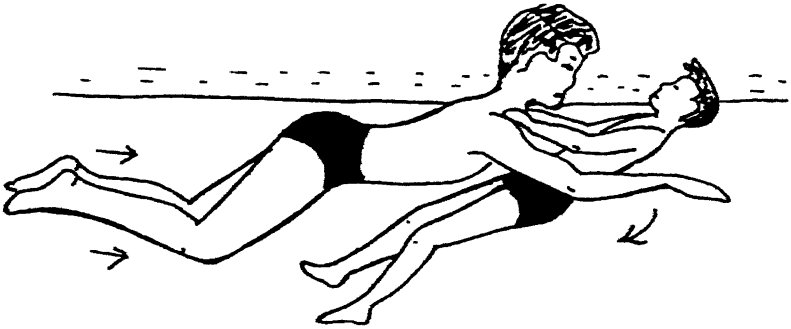
When the stroke is learned well, you will be able to swim fifty feet or ore with twenty complete strokes.



Complete breast stroke—side view

USING THE BREAST STROKE FOR ASSISTING A TIRED SWIMMER:

1. Tired swimmer in back float position. This method can be used when the water is quite calm, and is adaptable to both adults and children.
   - (a) The victim places hands on swimmer's shoulders.
   - (b) **Victim's arms must be kept straight** as he or she is being carried.

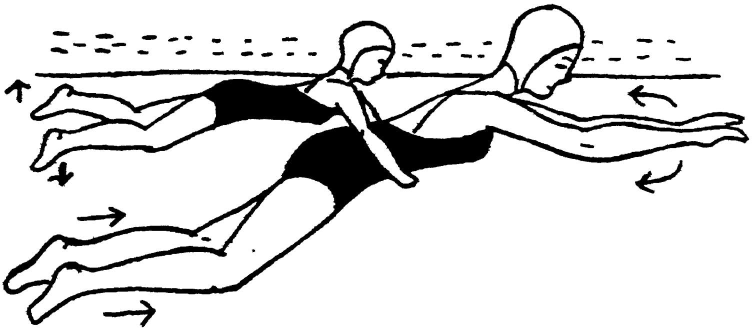


Tired swimmer's carry, in back float position

2. Tired swimmer in the prone position.

This is usually used with small children or others who have not learned to float on the back. It also can be used in rough water when swimming against the waves. The strong swimmer can regulate his or her strokes so that the waves can be broken away from the tired swimmer.

- (a) The victim places hands on the swimmer's shoulders, or waist.
- (b) **The arms must be straight** in this position also.



Tired swimmer's carry, in prone position

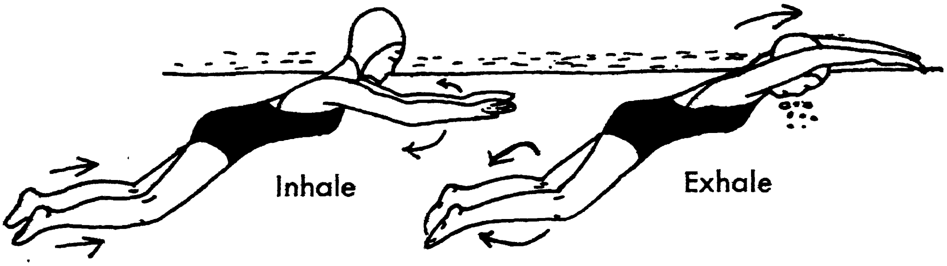
- (c) Tired swimmer can assist by doing a "frog" or "flutter" kick.
- (d) Encourage the tired swimmer to relax and float with the **shoulders under water.**

The breast stroke is also one of the most efficient strokes for swimming underwater. It can be used effectively as well when a swimmer is fully or partially clothed. All good swimmers should practice swimming while wearing some clothing, to prepare themselves for such emergencies as the capsizing of a boat or the submergence of a motor vehicle.

THE ORTHODOX BUTTERFLY WITH FROG KICK:

This stroke has developed into a popular and spectacular stroke and is used in most water carnivals and swimming meets. The butterfly, with the orthodox breast-stroke kick (frog kick), can be learned after the regular breast stroke has been mastered. It can be used in formation swimming, synchronized patterns, or tandem swimming, and presents a beautiful and varied number when it is done slowly and rhythmically in groups. Very agile swimmers can coordinate the stroke quite easily by doing the following:

1. **Kick a little deeper in the water** than you do when doing the frog kick with the former breast stroke.
2. In the arm stroke, the **arms are pushed down a little deeper** than they are in the regular breast stroke; they also go farther back toward the hips in a strong, pushing action.
3. The **arms are then raised out of the water** and quickly thrust forward over the water in their recovery.



Butterfly stroke with frog kick

4. **The back should be well arched** to allow freedom of movement for both arm and leg strokes.
5. **Inhale while the arms are stroking; exhale under water** as the arms go forward.
6. The stroke analysis is: "Pull with both arms, then kick (frog kick) and raise both arms over the water for their recovery and a momentary glide."

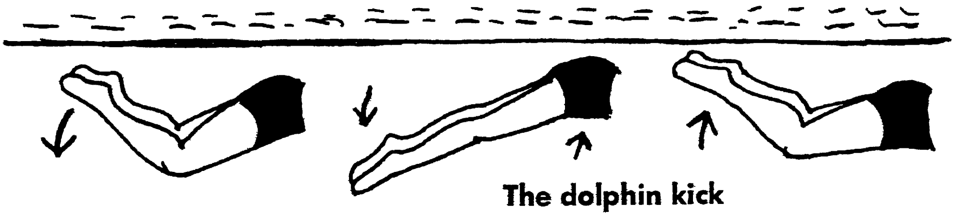
The timing is the same as that of the regular breast stroke with the arms stroking as the legs are coming up to stroking position; the arms then go forward as the legs stroke and push the body forward with a definite thrust.

THE DOLPHIN BUTTERFLY:

This is definitely an advanced stroke and some of the agile swimmers will find a challenge in mastering it. Those who have developed a good American crawl can progress at the greatest speed, and can adapt their rotary breathing to the timing of this stroke. However, with the dolphin kick, the head is not above water very long at any one time, making efficient breathing a little more difficult than it is for the crawl. Swimmers who enter competition need all the oxygen they can get to complete the required distance with the overhand thrust, for no other stroke demands such an expenditure of energy as this one!

The following is the description of practice for the dolphin kick, the kick which is the newest addition to competitive strokes. Like the flutter kick of the crawl, the drive comes from the hip and slightly bent knee at the top of the stroke, but—**both feet stroke at the same time!** The body of the swimmer also moves in an undulating motion in its entire length, and the kick itself begins at the hip, with the entire leg, knees, ankles and feet pushing downward in a strong, driving force.

1. With a kickboard practice the kick with the **feet slightly toed in** and the legs about two or three inches apart.
2. **The hips will rise** toward the surface as the legs straighten at the end of drive.
3. For the leg recovery toward the surface, the knees should open slightly; the hips will be lowered to their deepest point during this movement.



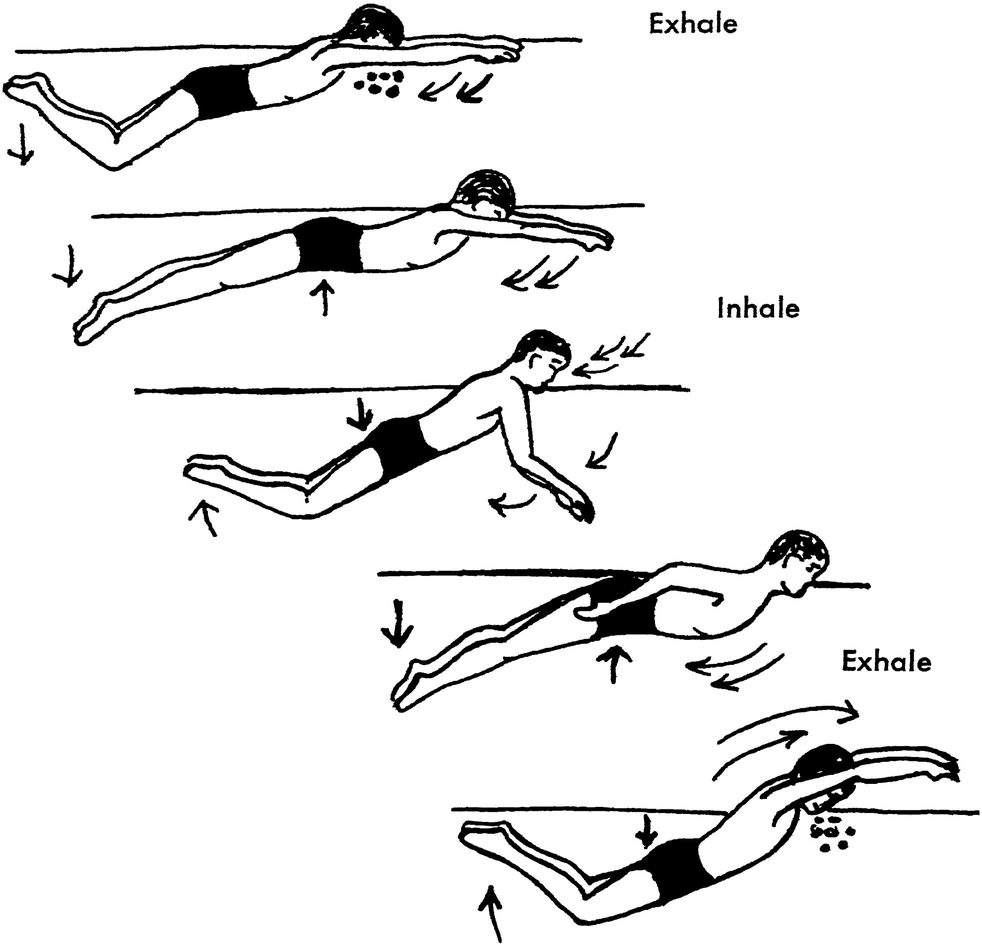
The dolphin kick

4. **The stroke analysis is:** "Stroke, recover, stroke, recover, etc." With practice it can soon be done faster, with emphasis being given to the downward stroke with "Stroke, stroke, etc."

Practice with the swim fins, either in a face float or with the kickboard, really gives the swimmer the "feel" of efficient propulsion. Fins also help in coordinating the undulating motion of the entire body.

COMBINING LEG AND ARM STROKES:

If the arm stroke was mastered in the orthodox butterfly, the main problem now is to coordinate the timing of two kicks for each complete arm stroke. For the first attempts it can be practiced while doing a face float without the addition of the breathing rhythm.



Complete dolphin stroke

1. The first kick, or downward stroke with the legs, is made as the arms start their downward pull.
2. **The legs then rise while the arms are at their deepest point** and the head is raised above the surface for inhaling.
3. The second stroke with the legs is made when the arms are forcefully pushed toward the hips, and then raised out of water. This last drive with the legs, and forceful push with the arms, propels the body forward in a momentary glide.
4. The legs rise again to the surface as the arms are going forward.
5. The exhaling should be started as soon as the arms complete their stroke and begin to come out of the water for their recovery.
6. The head can be kept in the front facing position for inhaling as the arms stroke, or it can be turned slightly to the side for grasping the air in the bow-wave which is made by a vigorous arm stroke.

The mastery of this stroke is a great accomplishment for any swimmer, and anyone who can swim it well enough to compete in swimming meets deserves much personal credit for his or her endeavors. Those who desire to swim it for recreational swimming only will derive a great amount of personal satisfaction from their achievements. They also can be sure that they are in good physical condition as a result of their work done in the practice periods.

PART III
DIVING AND WATER SAFETY

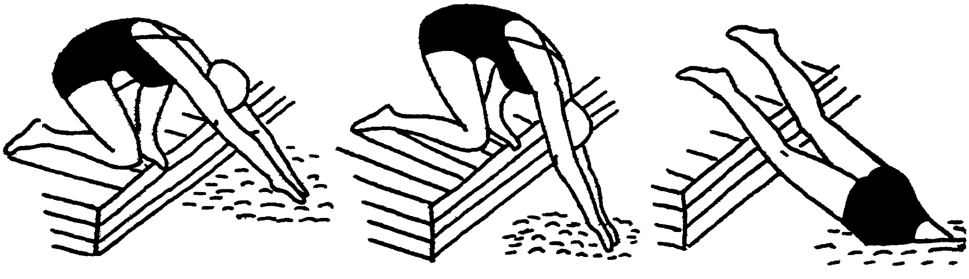
CHAPTER X
ELEMENTARY DIVING

Diving is the term used to describe a swimmer's entrance into the water from any object elevated above the surface of the water. Elementary diving is confined to a few dives in which the swimmer learns how to enter **deep water head first** from the edge of a diving float, pool or diving board.

THE BEGINNER'S DIVE:

Beginners should do their first dives from an object which is as near the surface of the water as possible. Anything two inches or more above the water can be used, such as a step on a ladder, a small float, or a low dock.

1. Kneel at the edge of the platform with one knee and one foot on the edge.
2. Bend the body forward with the arms over-head.
3. **Pull** the **chin in** toward the chest and **press the ears with the arms.**
4. Tip the fingers up in sled fashion to steer you toward the surface after you dive.



Kneeling dive

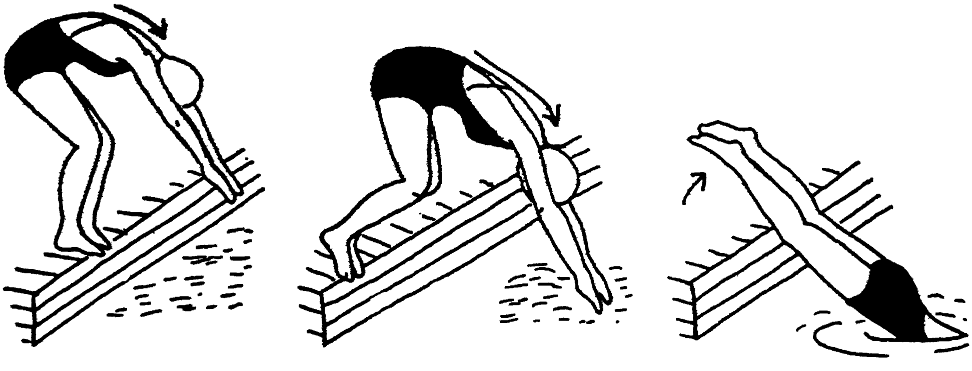
5. **Take a deep breath** and then fall forward, **keeping the head down.** This is very much like pushing into a face float from an elevated position.

If you go flat on the stomach or chest, you raised your head before entering the water. **The head should stay locked between the arms.** If you go down too far, you lowered your arms too much and didn't steer with the hands after entering the water.

BEGINNER'S STANDING DIVE:

Master the kneeling dive before attempting to dive from a standing position.

1. Stand with both feet on edge of diving platform.
2. Bend over with arms over-head and **chin pulled in.**
3. **Bend knees slightly** so that you can **push feet up** as you leave the edge.
4. **Take a deep breath** and fall forward, **pushing up, not out,** with both feet.
5. **Point** the **toes** and **keep** the **legs together** for a good entrance.

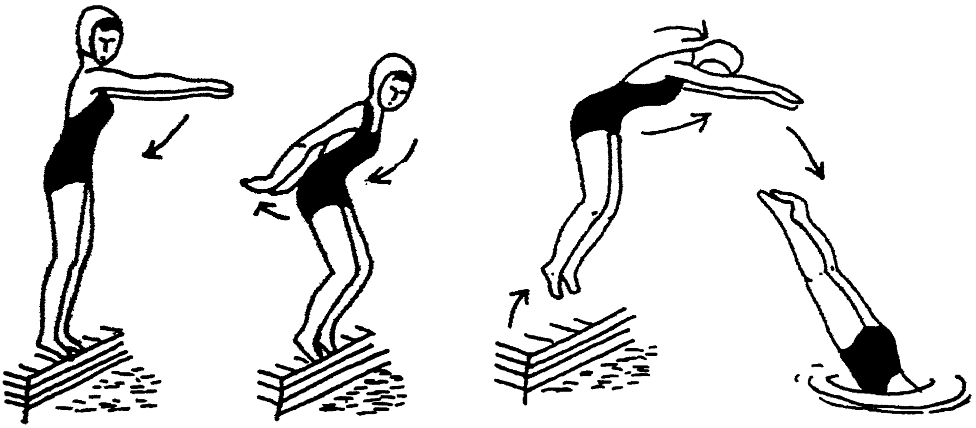


Beginners' standing dive

Gradually reduce the body bend until you are standing nearly erect and diving quite well with a slight spring from the toes. Do not go to the next dive until you have done at least ten good dives from the standing position.

THE STANDING FRONT DIVE:

The hands, arms, head, body and legs should be in a straight line when you enter the water. In many fancy dives, they are in different positions in the air, but they return quickly to the straight position for a smooth entrance.



Standing dive with spring

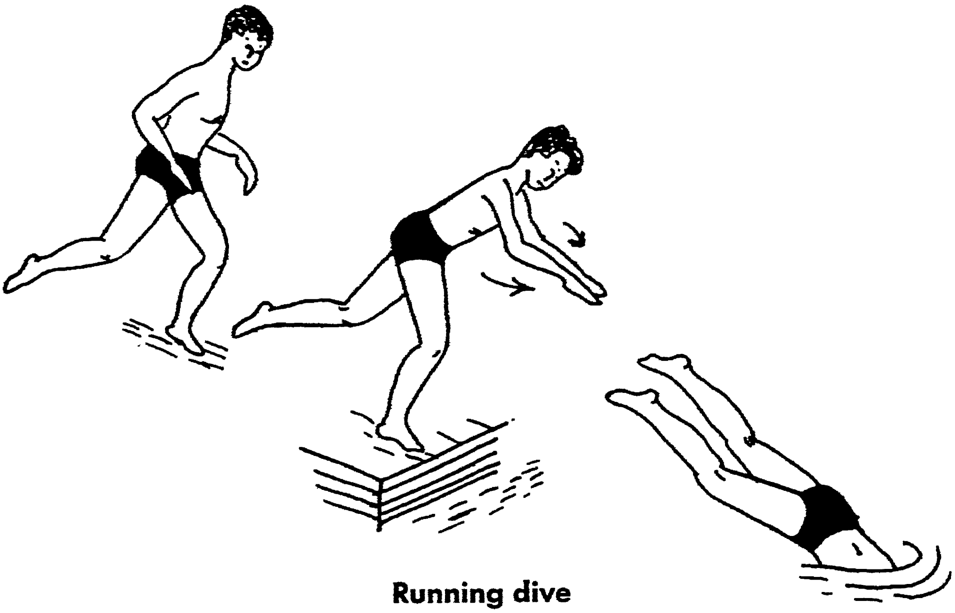
1. Take a standing position on the edge of the platform or pool, with arms extended in front.
2. As you bend your knees in preparation for a spring, swing the arms down to the sides.
3. Push from the toes upward and **swing the arms forward** and **up,** lifting the body with them.
4. Quickly **pull the chin in** and **thrust the head down** for a good, straight entrance.

Try to enter the water **within five feet** of the platform. If you spring the **body up instead of out,** over the water, this can be done easily. Aim to get height to your standing front dive rather than distance over the water. It will prevent you from going flat on the surface.

THE RUNNING FRONT DIVE:

This dive is started a few feet back from the edge of the diving platform or diving board. The diver takes three or four running steps, leaving the edge with a one-foot take-off. The three preceding dives were taken from a two-foot take-off, with both feet leaving the platform at the same time.

1. Run a few feet with arms swinging naturally.
2. When you reach the edge, **swing the arms forward and thrust the head down** between the arms.
3. Enter the water with the body in a half perpendicular position, as close to the platform as possible.



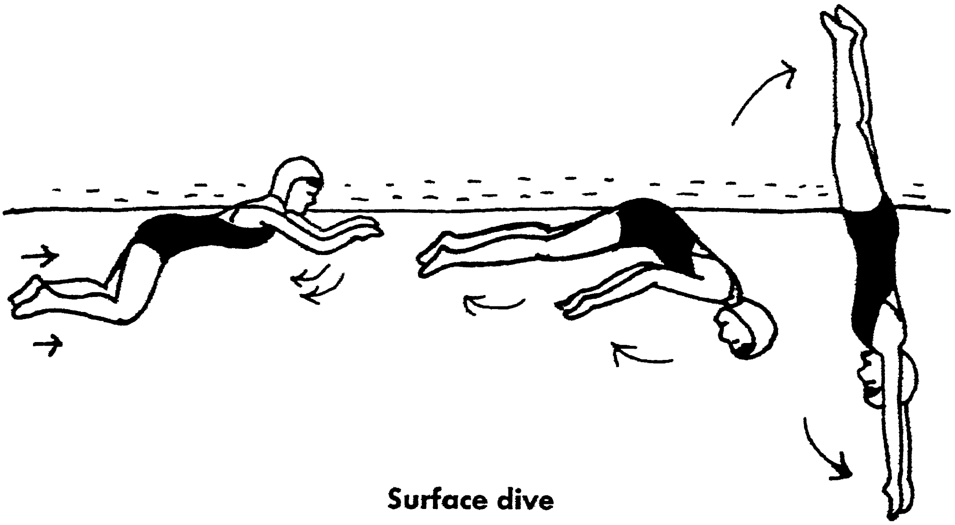
Running dive

The running dive is fun for children who want to play tag and enter the water quickly. However, running should not be done on a wet, slippery surface. Docks and diving platforms should be covered with some non-skid material which will prevent many falls on slippery boards.

THE SURFACE DIVE:

This dive is started from the regular swimming position in the water and enables a swimmer to go under water to pick up objects on the bottom. Children like to gather stones, shells and many other things that can be found under water. Advanced swimmers can use the dive in recovering other swimmers who have gone to the bottom and are unable to return without assistance.

1. In regular swimming position, extend both arms forward as done in the breast stroke.
2. Do a quick "frog kick" to give a push for the dive.
3. **Take a deep breath** and push the arms down and sideward, and then rotate the palms up toward the surface.
4. Bend the body to a jack-knife position and kick the legs up to a straight position over the water.



Surface dive

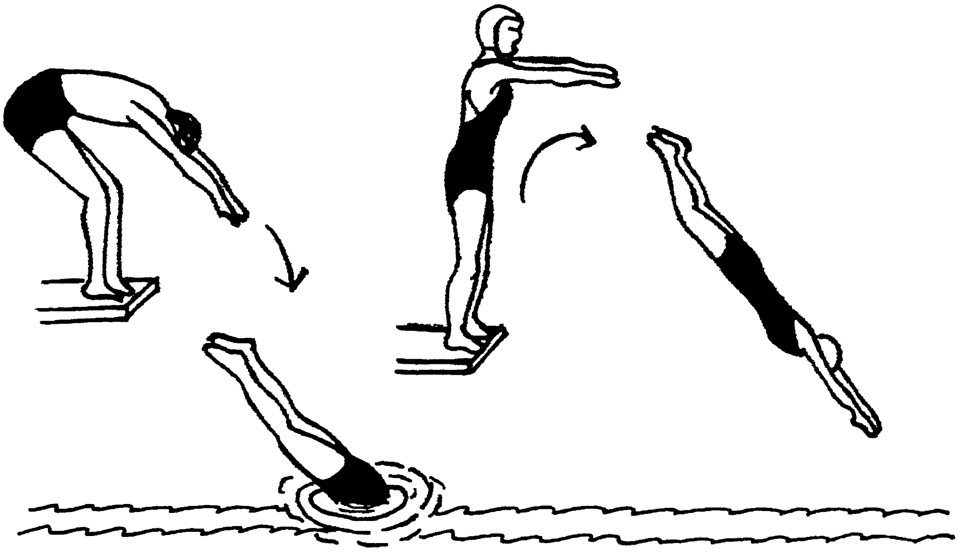
This dive is very difficult at first for some swimmers and will require a great amount of practice. Others, who have had trouble with floating, can go down to quite a depth without much effort.

To come up, point the hands and arms upward and use a scissors or frog kick to speed the ascent. Some swimmers turn themselves completely over and place their feet on the bottom, giving themselves a strong push toward the surface.

DIVING FROM THE SPRINGBOARD:

Beginners usually have some fear of the extra height above the water when diving from the spring board. For the first attempts divers can start with the kneeling dive and follow the same progressions as they did from a lower level. When they have mastered all beginners' dives and can do a standing front dive with a slight spring from the end of the springboard, they are ready for more advanced diving.

Springing the board can be practiced by jumping several times near the end, and then jumping into the water feet first. The actual jumping is very similar to the coordination used when jumping rope, with the arms swinging in natural, circular motions. After getting the "feel" of the spring, the diver can practice the front dive as it was done from the standing position.

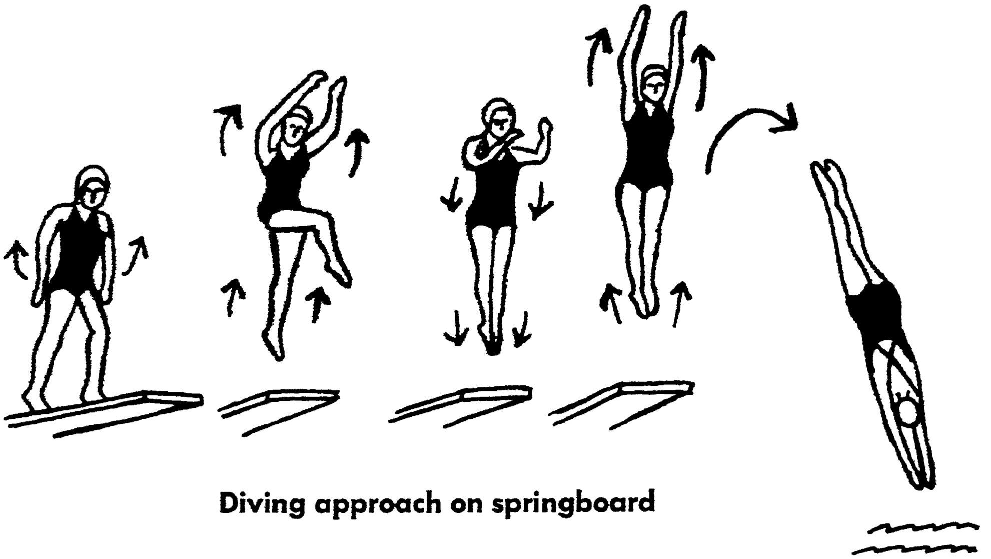


Beginners' dives from springboard

THE DIVING APPROACH ON THE SPRING BOARD:

The standing position is taken about three or four steps from the end of the board. The approach is actually one step, then a spring from the second step, and finally coming down on the end of the board with both feet, thus springing the board before diving into the water with a straight entry. The best dives are performed with as much height as possible and within a safe distance from the end of the board. The following instructions help most divers in their first attempts:

1. Stand erectly at least three steps from the end of the springboard and raise both arms forward to shoulder height.
2. Rise on tip-toe with both feet and step forward with the foot that feels natural for giving a strong upward lift when springing.
3. Spring from the second step, raising the thigh and bending the knee of the leading foot in a strong, upward lift. The arms swing upward in unison with the legs to help lift the diver in the air.
4. Come down on the end of the board with both feet and then spring into the dive, **raising both arms** to diving position and **bringing the head down** for the entry.



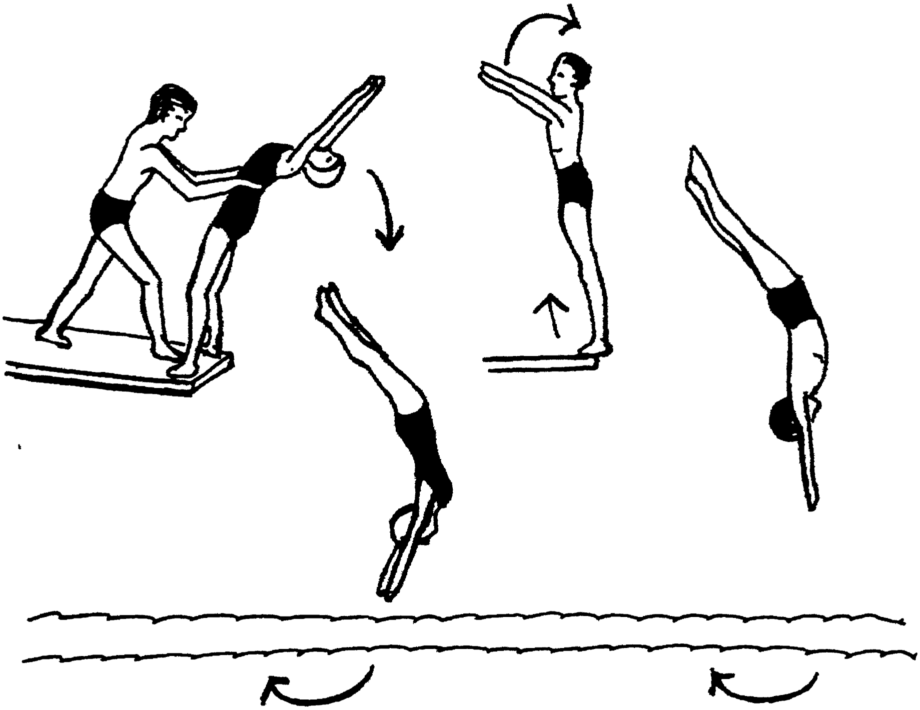
Diving approach on springboard

Many divers need help in getting height for their dives. An instructor or assistant can hold a pole or rope across the front of the board, about two feet from the end of it and at least two feet higher than the board. As the diver gains height, the pole can be raised higher. Diving over the pole is very similar to learning to dive over a high-jump pole.

THE BACK DIVE FROM THE SPRINGBOARD:

An assistant is often needed to help divers in those first attempts in diving backwards into the water. Many divers experience many qualms and fears when they cannot see where they are diving, but after a few back dives are mastered, their confidence develops so much that they can attempt any of the more difficult dives. An assistant can help the beginner by doing the following:

1. Stand on the end of the springboard with one foot between the diver's feet; the other foot should be back about eighteen inches in a good balancing position.
2. Instruct the diver to raise both arms over-head and bend the head backwards between the arms.
3. The assistant then places his arms around the diver's waist, giving her a little support as she arches her back into a back bend.
4. The diver simply falls into the water in this arched position and continues to keep the back arched until coming up under the springboard.



Beginners' back dives

Many divers need help several times in this dive before they can do it unassisted. After they have gained confidence and can do the dive in the arched position, they can gradually stand more erectly and begin to spring from the toes from the end of the board.

The front and back dives are the basic skills from which most divers can proceed and perform more difficult dives such as the front and back jackknife, front and back somersaults, swan dives, gainers, twists, etc. For those who desire to practice these dives, they are described and illustrated in many diving manuals.

CHAPTER XI
SKIN AND SCUBA DIVING

Every generation of humans has had an unlimited amount of interest in the underwater world ever since the beginning of time. Now, with the invention and perfection of skin and scuba diving equipment, man can explore depths which were not even considered by earlier divers. In the last ten years millions have turned to this adventurous sport and found it to be both exciting and profitable. In addition to the many seafoods which are harvested by divers, many valuable relics have been recovered from sunken ships. And many valuable minerals, including gold, have been found offshore and along river banks. One of the latest developments for divers is that of recovering missile parts from the ocean depths.

The saving of human lives is now one of the important uses of skin and scuba diving. With this new equipment a diver can search more thoroughly for a swimmer who has gone under water and cannot resurface. If victims are recovered within a minimum of time, they have a better chance of being revived by our present methods of resuscitation.

This new equipment is also being used by instructors of life saving, for in an underwater position they can better view the rescue techniques, thus making improvements in faulty operations. In the competitive field of swimming, coaches can view turns and underwater strokes, making each swimmer a better and faster competitor.

Skin and scuba diving is now as safe as any other sport which involves knowledge of special skills and safety measures. Loss of life is limited to those who have had no training in the proper use of their equipment or the safety practices connected with this activity. And in many cases the divers were not good swimmers in the first place. The following are the minimum requirements in basic skills:

BASIC SWIMMING SKILLS FOR SAFE SKIN AND SCUBA DIVING:

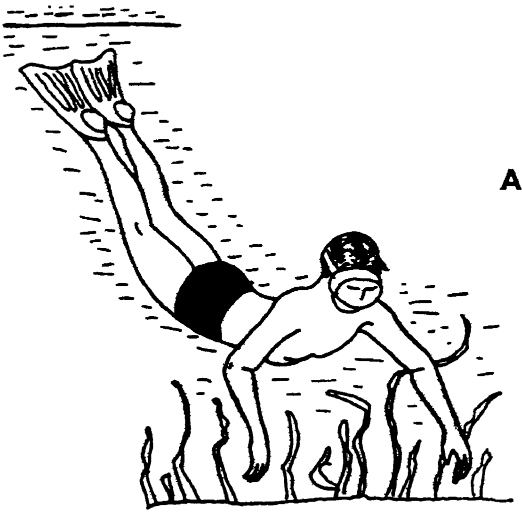
1. **The mastery of all three kicks:** flutter kick (front and back), frog kick and scissors kick.
2. **Treading water** without use of the arms or swimming aids **for one minute.**

3. **Strong arm strokes** for underwater "dog paddle," breast stroke, side stroke, sculling in back position, reverse sculling, and elementary back stroke.
4. **Floating for one minute** without aids, either on the back or with the face float.
5. **Swimming 200 yards without aids** and with good breath control.
6. **Swimming underwater** without equipment at least 10 yards—any stroke.
7. **Surface diving** without equipment at least five times.

SKIN DIVING EQUIPMENT AND THE SAFETY PRACTICES FOR ITS USE:

Skin diving covers that part of diving near the surface of the water which can be done with a mask and fins. The safe depth for this sport is from five to ten feet and the average length of time for each dive is from one to three minutes, the time that humans can hold a breath of air. When the diver feels the urgent need of exhaling, he must surface, exhaling on the ascent and must have enough time to reach the surface before inhaling.

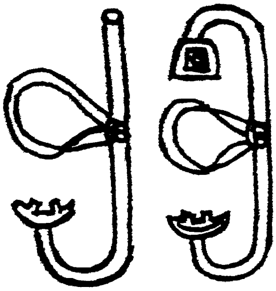
One of the most important safety rules for skin diving with mask and fins is to avoid diving in weedy and muddy areas. Weeds cling to the fins and other equipment, and may cause the diver to stay under water too long; a delay of only a few seconds is all that is needed to cause a possible suffocation before reaching the surface.



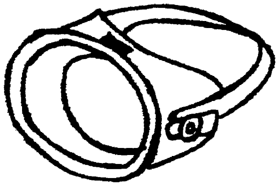
Avoid swimming in weeds with fins and mask

The following is the necessary equipment for the beginning skin diver and is available in many styles and colors:

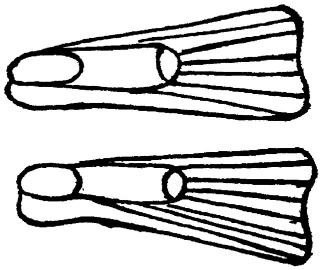
Masks which cover only the eyes and nose should be selected with great care—for safety, maximum vision, and well fitted to prevent leakage. The following items should be considered in selecting a good mask:



Snorkels



Mask



Swim fins

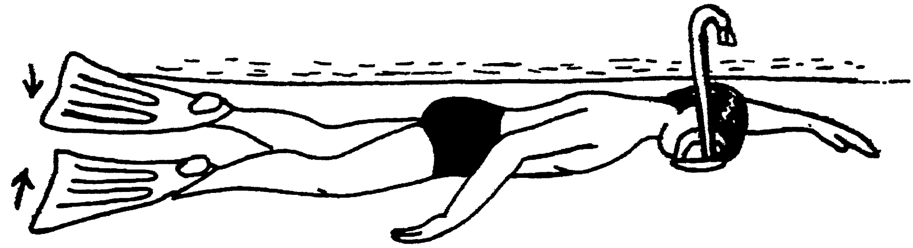
1. **The front piece should be made of shatter-proof glass.** Children can use those made of clear plastic, but they are easily scratched and become foggy in deep water.
2. **Choose a mask with a soft lip** which has a surface extending sideways about one-fourth of an inch to fit snugly around the face. When trying on the mask, inhale through the nose, and if there is good suction around the face, the mask is leak proof.
3. **Check the straps for strength and durability.** They should also have adjustable buckles to insure a strong, direct pull against the diver's face.

Swim fins should be selected according to the individual diver's choice of activity, and should be fitted with comfort in mind.

1. **Flexible fins are better for the novice or children.** The more rigid fins give greater speed but they require more effort, sometimes causing cramps in the leg muscles when they are first used. However, with practice, the muscles become conditioned to the leg strokes.
2. **Fins are made with different angles;** those with a slight downward angle provide better propulsion with every stroke.
3. If the whole family is using one pair of fins, they should be the adjustable type with the open heel; if for one individual, they can be fitted with a closed heel and are more comfortable for long sessions of practice.

4. **Floatable fins are fine for children** and others who confine their activity to shallow water, but the deep water diver who has a great deal of equipment to handle, such as tools, cameras, spears, etc., has difficulty when a fin slips off and floats toward the surface.

Snorkels and snorkel-masks were developed to enable the swimmer to breathe while swimming along the surface of the water in a position to view the many wonderful objects in the underwater world. With this equipment swimmers do not have to lift their heads for a breath of air, thus allowing a continuous viewing of the areas beneath them.



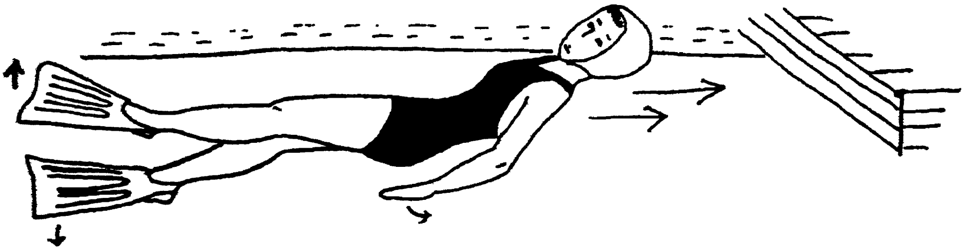
Swim fins and snorkel mask

Snorkels are used by many divers who dive quickly to spear a fish or snap an action scene with an underwater camera. As in diving without a snorkel, divers must take a deep breath of air to sustain them until they can surface for a new inhalation. A diver using a snorkel also must retain enough air in the lungs to exhale above water to clear the snorkel of any water that has remained in the tube. This must be done before inhaling a new breath of air.

1. **The best snorkel for advanced divers** is the simple J-shaped tube which has a comfortable mouthpiece. This tube has no valve at the top, thus enabling the diver to clear it of water quickly after surfacing.
2. **The novice or children prefer the J-shaped tube** with a curved top and a valve which closes when the top goes under water. However, the majority of these leak when used in deep water and are not cleared of water as easily after surfacing.
3. **Snorkel masks are not considered as safe** as the snorkel with a mouthpiece which aids swimmers in learning correct breathing habits. Those that cover the eyes and both the mouth and nose are seldom leak-proof and may cause panic in the inexperienced diver. They find themselves unable to breathe without taking off the entire mask.

Some techniques that should be learned for safety in skin diving and using this equipment are given in the following items:

1. **In preventing a mask from becoming foggy,** a diver can rub a small amount of saliva on both sides of the glass and then rinse it in the water before putting it on. The saliva coats the glass so that moisture does not adhere to it.
2. **In clearing the mask of water** which has leaked into it, tip the head to the side and press the upper edge of the mask against the side of the face; then blow forcefully into the mask, forcing the water out the bottom and other side of it.
3. **When swimming on the back with fins,** one safety precaution is to be sure there are no stationary objects, or other swimmers in the course taken. Great speeds can be attained with finning strokes and the swimmer can get a severe blow on the head by hitting a dock or side of a pool, and other swimmers also can be hurt if they are bumped unexpectedly.



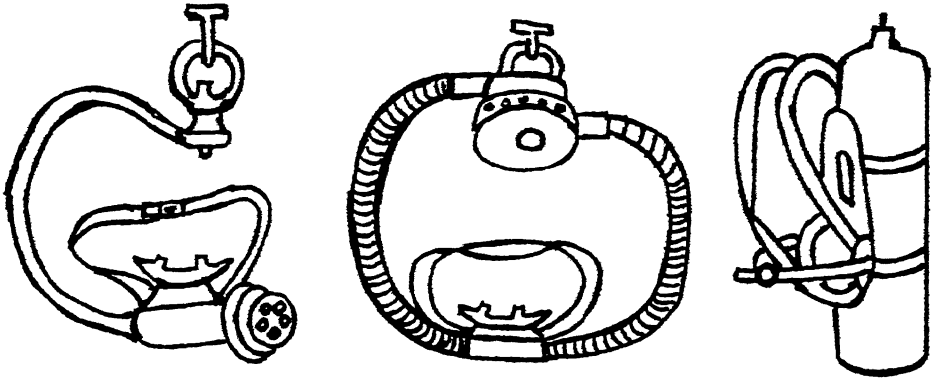
Sculling stroke with swim fins

SCUBA DIVING AND EQUIPMENT:

Scuba diving covers that field of deep diving in depths from 10 feet to about 150 feet. Professional divers can go deeper, but the amateur can have a great deal of fun in the shallower areas. It also is advisable that everyone who desires to enter this new world of water activity should join a scuba diving club which is directed by an experienced diver, or obtain instruction from a qualified instructor. The techniques and skills are almost as involved as those for driving a car, piloting a plane or helicopter, or handling other mechanical equipment.

The following descriptions of equipment and basic techniques are given only as an introduction to the sport of scuba diving and should be followed with practice and observance by a competent diver. **A good scuba diver is an experienced skin diver** who knows how to safely use a mask, fins and snorkel, and is ready to add the aqua lung and pressure regulators for underwater breathing.

1. **Aqua lungs** are made up in single tanks for short dives of about a half hour, and larger double and triple tanks for periods from one to two or more hours. They should be filled with certified, compressed air, and only to the amount of pressure listed on that particular tank. For safety every tank should be tested at least every two years to detect possible dents or other weaknesss in its walls or valves.
2. **Pressure regulators** come in two popular types: a single hose type and a double hose type. Both can be securely fastened to the valves of the aqua lungs.



Single and double tube regulators, and air tank

3. **There are two types of valves available:** a straight valve which only turns the air off and on, and a "K" valve which has a built-in air reserve mechanism, the latter being the most valuable. A diver needs to know when the amount of air in the lung is nearly gone so that he has time to surface for a refill.
4. **Regulators** can also be chosen with single or two or more stage adaptors. The single-stage adaptor delivers the air to the swimmer in the same pressure and volume as the surrounding water pressure. The two-stage regulator does the same thing but has a diaphragm which releases the air that is required to increase the pressure within the diver to the pressure in which he is swimming.

5. **Diving suits come in two types: wet and dry.** The wet suit is made of foam rubber or plastic which allows the water to penetrate to the body, but the tiny air pockets in the material prevent the water from circulating, thus keeping the warmed water next to the diver's body. The dry suit is made of rubber sheath and keeps the swimmer dry, providing no leaks occur around the face, hands, etc., and no tears are made in the material. Warmth is supplied by warm undersuits which act as insulators.

6. **Weights are needed by divers who wear equipment** to help in overcoming the extra buoyancy created. These weights fit into a weight belt around the waist and can be removed or added as they are needed for the particular dive. Divers should test their buoyancy without weights and add them according to the requirements of either salt water, or fresh water, and the depth of the dives.

SAFETY PRACTICES IN SCUBA DIVING:

The instruction literature that is distributed with most scuba equipment gives many safety rules and should be studied very thoroughly. It will also explain many causes of faulty operation of the equipment, the small adjustments that the diver can make, and others which will require the attention of the manufacturer. Some of the safety measures given with the instruction materials are listed here:

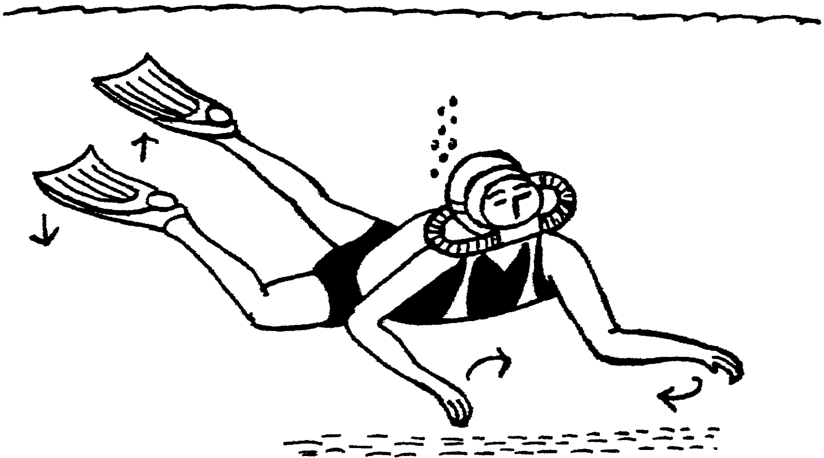
1. **Ear plugs should never be worn for deep diving.** They prevent the equalization of the pressure on the outside of the ear drums with the pressure within the middle ears, thus causing rupture of ear drums. Likewise, the **Eustachian tube** (an air tube connecting the throat and inner ear) **should always be kept open.** A diver who has swollen tissues in the nose and throat, due to colds or other causes, should be checked by a physician before diving.

2. **Learn to use your diving equipment in shallow water** and practice these skills: entering the water feet first, head first and backwards; removing the mouthpiece and replacing it; taking off the aqua lung and replacing it; clearing the mask of water—underwater; and swimming in many directions and positions.

3. **When diving to deeper water, descend at a slow rate,** breathing as often as possible to equalize the pressure within the body with the pressure of the water outside.

4. **Always dive with a buddy or an instructor—never alone!**

5. **When swimming toward the surface, swim quite slowly** and breathe as often as you can to again equalize the body pressures. The rupturing of blood vessels and lungs is more prevalent in ascending than it is when descending.



Practice with scuba equipment in shallow water

Water pressure increases as the depth of the water increases. When a diver goes down about 30 feet, the air in the lungs (due to the scuba regulator) is made about twice as dense as it was on the surface, thus preventing discomfort from the outside water pressure. Then when the diver ascends, the pressure is less and the air will begin to expand, particularly if the diver holds his breath. This expansion causes the rupturing of lungs and other tissues of the body.

Therefore, **use the breathing equipment at all times when diving in deep water,** and make sure that **there is enough air reserved in the tank** to allow you to surface slowly. The basic physical laws which should be studied by all divers for safety are: Boyle's Law, which describes the decrease in volume of air as the pressure rises; Dalton's Law, which projects the problems of partial pressures; and Charles' Law, which gives the relation of pressure and temperature. All of these are well described and illustrated in many diving manuals and other texts.

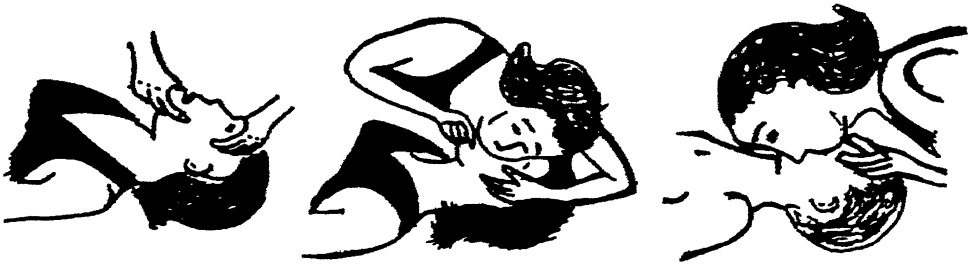
CHAPTER XII
RESUSCITATION AND EXTERNAL HEART MASSAGE

The most efficient method of resuscitating a suffocated individual is by mouth-to-mouth resuscitation. This method was used extensively in biblical times and has now been accepted by the surgeon-general to be used in the army. It also is the most practical method to use with small children.

Artificial respiration is necessary in cases of drowning and suffocation from smoke, gases, and other causes, but **only if the victim is not breathing** when discovered. It should be administered as soon as possible, for the heart becomes paralyzed and the brain cells are damaged without oxygen. When a person drowns, he or she has been cut off from the supply of oxygen by the automatic closing of the epiglotis, a valve which controls the passage of air through the windpipe to the lungs. When any foreign substance, such as water, touches the epiglotis, it immediately closes, thus allowing no water to enter the lungs. A victim while struggling in the water may swallow a small amount of it, but the lungs will usually remain clear.

MOUTH-TO-MOUTH RESUSCITATION WITHOUT EQUIPMENT:

1. **Lay the victim on the back** and pull the jaw down to see if the throat is clear of food or other substances. If not, it can be cleared with the forefinger, or the obstruction sucked out by mouth and quickly spat out, if no other suction equipment is available.
2. **The tongue should be pressed down** away from the roof of the mouth.
3. The operator then kneels beside the victim, **takes a deep breath,** and, placing his mouth firmly over the victim's mouth, should blow forcefully until the chest begins to rise.
4. **One hand should hold the jaw up and mouth open,** and the other hand holds the nose closed.
5. To let the air out of the victim's lungs, the operator simply raises up and again takes a deep breath for the next inflation.



Mouth-to-mouth resuscitation

6. Repeat the entire breathing cycle until the victim breathes voluntarily —**at least an hour,** if there has been no reaction and no other help has arrived.
7. Adults should receive a full breath of air once every five seconds, and children about once every three seconds. Children need about half as much air as do adults and it can also be given through the nose, with the mouth held shut. Small puffs are often sufficient.
8. If the victim begins to breathe, discontinue artificial respiration; but if breathing again stops, the operation should be resumed.
9. **Keep the victim as warm as possible** with blankets, towels, or other clothing; also loosen all clothing that may prevent good chest expansion.

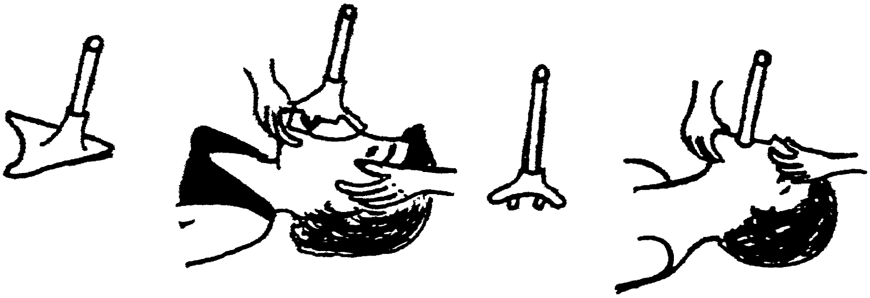
Mouth-to-mouth resuscitation may seem a little crude to some people, but it involves no more personal contact than the normal kiss. And in many instances it has proved to be the "kiss of life."

EQUIPMENT FOR MOUTH-TO-MOUTH RESUSCITATION:

Some people like to use some of the available equipment that facilitates this method of resuscitation. There is an S-shaped tube which fits over the tongue and protrudes out of the victim's mouth in a good position for the operator. And any straight piece of tubing such as garden hose, or tube from a snorkel, will serve as efficiently as some equipment. There is now a plastic face plate which covers both the nose and mouth and has a removable tube for easy storage. Some of this equipment should be stored in an accessible place on every boat, at every water front, or pool. The following instructions give the methods of use:

1. In using the S-tube, **the chin must be held up** to close the mouth tightly around the tube, and the nose must be held closed with one hand.

2. Care must be taken in using a straight piece of tubing so that it is not forced down the throat too far. The mouth and nose also have to be held firmly closed.



Face plate and snorkel tube for resuscitation

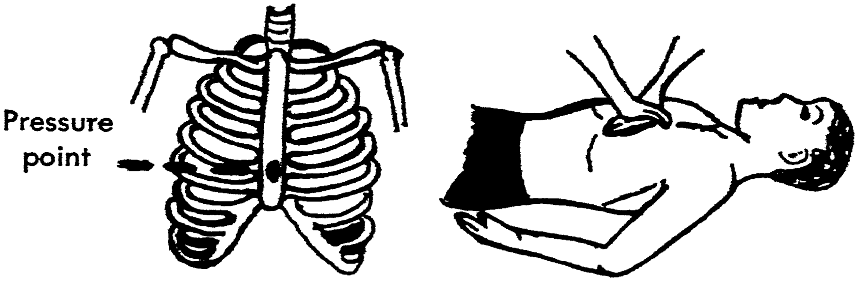
3. A snorkel tube with a mouthpiece can also be used. The mouthpiece should be fitted between the victim's teeth and **chin pushed up firmly** to prevent leaks. Here, too, the nose must be held.
4. The plastic face plates cover both the nose and mouth; however, the mouth must be held open and the position of the tongue has to be checked occasionally.

The air is automatically expelled from the victim's lungs by the normal weight and pressure of the chest muscles. It is also important to remember that an unconscious person is more easily inflated than a conscious individual who has control of the chest muscles. Therefore, care should be taken with children in order to prevent over-inflation of their normal chest expansion. Lung tissues are very thin and can be ruptured very easily when the air pressure within them is too great.

Mouth-to-mouth resuscitation can also be given in cooperation with another operator who can administer external heart massage if the heart has also been stopped by the suffocation. The rhythm of the two operators has to be regulated to the number of inflations the victim needs per minute, and particular attention should be given to the breathing time and rate of pulse for the size of the victim.

EXTERNAL HEART MASSAGE, OR STARTING A STOPPED HEART:

This method of reviving suffocated victims has been developed and perfected by the medical staff of Johns Hopkins Medical School in Baltimore, Md. It can be performed by anyone who has a basic knowledge of the circulatory system and has had a chance to practice the manual operation for a short time. The preparatory techniques are very similar to those for resuscitation and can be applied in rhythm with the operations of the resuscitator. The following are the simple instructions for the operator:



External heart massage

1. **Place the victim on the back on a firm surface.**
2. **Be sure that there is no pulse and that the victim's heart has really stopped.** The heart often continues to beat after breathing has been discontinued.
3. **Check to see if the tongue is away from the roof of the mouth** so that the victim can be given artificial resuscitation.
4. Kneel beside the person and place the heel of one hand about **two inches** up from the lower end of the breast bone. (This spot can be found by locating the lowest ribs and tracing them to the end of the breast bone.)
5. **Place the other hand firmly over the first hand.**
6. Press down with both hands with enough pressure to depress the chest from one to two inches in adults (about one inch for small children), and then release.
7. **Keep an even rhythm of pressing and releasing** for about 60 operations per minute for adults, and from 80 to 100 for children.
8. **The amount of pressure also varies with the size of the victim.**

A single operator can give both mouth-to-mouth resuscitation and external heart massage if there is no other help available. If the victim is not breathing when discovered, four or five quick ventilations of the lungs should be given and then heart massage administered for about thirty seconds. This alternation can be practiced for the first two or three minutes and then heart massage should follow without interruption. There is some ventilation of the lungs with each release by the massager, but the maximum amount of air necessary for efficient respiration is inhibited by the more rapid rhythm necessary to restore the heart to its normal pulsation.

The second operator, if one is available, can give resuscitation in rhythmic timing with the heart massager. The average breathing rate for adults is from 12 to 18 times a minute and the pulse rate varies from 60 to 80 beats per minute. The pulse rate for children ranges from 80 to 100 beats per minute. Therefore, these figures give an approximate rhythm of five beats for the heart to one inflation of the lungs. It also is advisable for the massager to skip one or two heart pulsations during the full inflation of the lungs by the resuscitator. When the lungs are inflated and added pressure is applied to the chest, the delicate lung tissues can be ruptured, causing internal bleeding and other congestion.

Reaction should take place within five minutes to prevent damage to brain and nerve tissues of the body. However, operations should be continued for at least 20 minutes, or until other help for resuscitating the victim has arrived. A doctor should be summoned by someone as soon as possible, but those present should know how to give resuscitation and **heart massage during those very precious moments** after the victim has been discovered. Best results for saving lives are obtained by efficient and quick application of these two operations.

The pulse should be checked about every three minutes to see if normal pulsation has been restored, and if it has, all external operations should cease. Other first aid measures, such as keeping the victim warm and keeping space open for plenty of fresh air, should be followed by all those present.

CHAPTER XIII

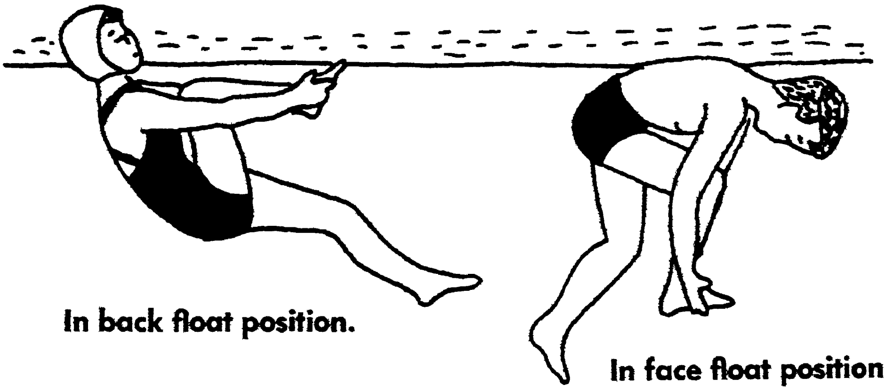
SAFETY PRACTICES AND RULES

A large number of drownings occur among good swimmers because they do not know how to handle an emergency in the water when it occurs. Swimmers are exercising in the medium of water which is treacherous in a number of different ways. They also are using muscles which are seldom used in normal activity, and when these muscles become over-tired, they become painful and cramped. However, most of these emergencies can be handled with safety if the **swimmer REMAINS CALM AND USES GOOD JUDGMENT.**

MASSAGING A CRAMPED THIGH, LEG OR FOOT MUSCLE:

A cramped muscle is very tense and knotty. Massage and exercise will relax the tissues and help in the circulation of the blood. The following instructions will assist a good swimmer in handling this emergency:

1. Float on the back and bring the afflicted leg as near the surface as possible.
2. **Rub the muscle with both hands,** up and down several times.
3. **Alternate the rubbing with a kneading action,** pinching the flesh with the fingers as deeply as possible.
4. Brisk slapping will sometimes relax the muscle.



In back float position.

In face float position.

Massaging a foot cramp

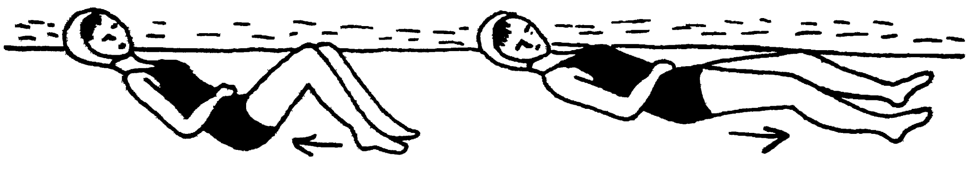
5. **Exercise the leg slowly,** and use a swimming kick which will rest that muscle. If the cramp occurred while swimming a stroke which used the front gliding position, try a back stroke.
6. After the muscle becomes less painful, swim very slowly, using the arms more forcefully than the legs. Many times the cramp will leave after a few strokes, but many times it may reappear and need more massage and rest.
7. Some swimmers prefer the face float position, because the rubbing action can be more effective. This position also stimulates the circulation of the blood toward the cramped muscle.

When you are afflicted with a cramp, **immediately let your swimming companions know** about it. However, it is good practice to see if you can massage your own leg and then swim to safety. This will develop your own skill and confidence in handling an emergency in which there is no immediate assistance.

DISPELLING A STOMACH CRAMP:

Stomach cramps are usually caused by digestive disorders which occur when the stomach is full and the cold water and strenuous exercise has interfered with the normal processes of digestion. If the pain is very acute and comes very quickly, there is not much that can be done without some assistance. In that case, **"YELL FOR HELP"** immediately and try to keep the head above water in some position.

When the cramps are not too severe and have seemed to develop gradually, it usually is best to relax in a back floating position.



Bend legs up and contract stomach muscles

Extend legs and relax stomach muscles

Expelling a stomach cramp

1. In the back float position, contract and relax the stomach muscles. **Alternate the contractions with deep breathing.**
2. You can also bend the knees to the chest, and then straighten them.
3. A gentle kneading of the stomach muscles with one or both hands will sometimes help.

Treading water for expelling a stomach cramp

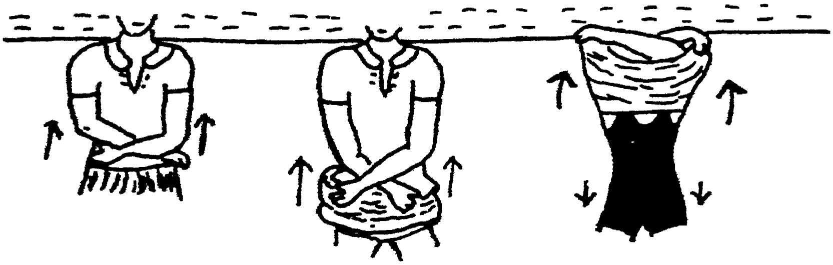
Some swimmers have found that treading water enables them to dispel any excess gas which may be causing the pain. In this upright position, a gentle kneading of abdominal muscles with one hand is often effective.

DISROBING IN DEEP WATER:

When a boat overturns and the occupants find themselves in deep water, fully clothed, the good swimmers should first assist all occupants to the side of the overturned boat. They then should proceed to disrobe before attempting to right the boat or swim any distance to safety.

1. In either the back float position, or the tucked face float position, **remove the shoes first.**
2. Secondly, remove trousers or skirt.
3. The **shirt is the last to be taken off** because some types of textiles will hold the air and help the swimmer in floating.
4. To remove a shirt over the head, cross the arms in front, and grasp the bottom of each side; then submerge and quickly pull the garment over the head.
5. **To remove a dress, tread water** until the dress can be pulled to the waist. Then cross the arms and grasp the whole skirt in bulk; submerge and pull entire dress over the head.

Disrobing should be practiced by all good swimmers until it can be done very quickly and efficiently.

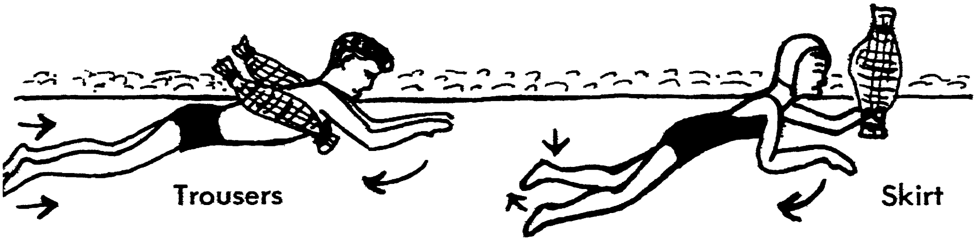


Removing shirt or dress in deep water

USING INFLATING CLOTHING AS FLOATING DEVICES:

Trousers and some types of one-piece shirts, skirts and dresses can be used by weak swimmers in helping them to swim the distance to safety.

1. **Tie the bottoms of the garment** in a tight knot.
2. Tread water and inflate it by passing the top opening over the surface of the water.
3. Bring the top of the garment down to the surface quickly and tighten the belt, tying it as tightly as possible.
4. Keep the openings under water and the air will stay in the garment.



Using inflated clothing to swim to safety

Clothing which is made of closely woven textiles will hold air very well when wet; however, many knit garments are porous even when they are wet and are not adaptable as floating devices.

GETTING OUT OF A SUBMERGED VEHICLE:

Many drownings now occur among drivers and passengers of motor vehicles that go over embankments into rivers, lakes, etc.; a few also go overboard from ferries. In such emergencies, all good swimmers should know the following steps in water safety:

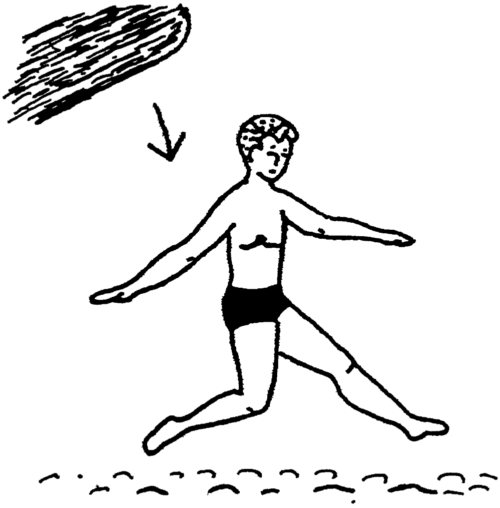
1. When the water reaches shoulder height in the vehicle, the pressure is equalized on the doors and they can be opened quite easily.
2. **Everyone should take a deep breath of the air** which has remained in the vehicle before opening the doors.
3. All swimmers should swim toward the surface as quickly as possible. The breast stroke is the most efficient in this emergency.
4. All non-swimmers, who can hold their breath for one minute or more, should push themselves out of the vehicle and try to climb or swim toward the surface. In this way, there is a good chance that they will float to the surface where they can be quickly rescued.

WATER SAFETY RULES:

Some drownings occur every year because swimmers do not follow a few simple rules that should be well learned by everyone. We always shall have a few accidents from unavoidable situations, but if every good swimmer would remember the following and practice them every time they participate in water activities, a great number of drownings would be prevented:

1. **Do not swim alone**, especially in unknown waters.
2. **Do not swim a long distance with a full stomach.** Allow a full hour after a lunch or light meal; two hours after a heavy meal. For recreational swimming which is not too strenuous, swimmers can go in the water directly after eating. Normal digestion goes on in water as well as on land if there is no emotional constraint, and the water is not too cold.
3. **Do not swim too far from shore** without being accompanied by good swimmers, or a boat which is occupied by someone **who knows how to assist you** in case of emergency.
4. **Do not try to swim a long distance when you feel tired.** Distance swimming should be practiced daily for good body conditioning. Heart faliures often occur when the activity is too strenuous, and swimming is one of the sports that uses nearly every muscle in the body.

5. **Do not swim for too long a period in very cold water.**
6. **Do not swim in water which is posted as "dangerous."** A great many streams have a strong under-tow and are filled with active springs and currents which can pull a good swimmer off course.
7. **Do not swim in contaminated water, or stagnant ponds.** You may not drown in these kinds of water, but you may contract a disease which may be very serious.
8. **Do not dive into any water before you know how deep it is,** and whether it is free of hazardous conditions.
    - (a) Before diving, explore the bottom by surface diving, and look for stones, sharp projections, weeds, etc.
    - (b) If you are forced to enter the water quickly from an elevated object, **jump into it,** keeping the legs apart and the arms sideward. This position will prevent you from going too deeply.



Jumping into deep water from elevated point

MAKING SWIMMING AN ENJOYABLE SPORT FOR EVERYONE:

Swimming is one of the most healthful and enjoyable sports known to mankind, and it can be adapted to every age group. All good swimmers should help beginners in getting adjusted to the water with the least discomfort possible. They should also help them in learning to swim a stroke that makes him or her feel relaxed in the water. If everyone could learn a stroke that makes swimming enjoyable for them, they usually will proceed to more efficient strokes and become good swimmers.

The following are some of the things that **should not be done** with beginners who are "afraid of the water":

1. **Do not "duck" people** who have not yet learned to hold their breath while they are under water. Breathing water into the air passages and lungs is very uncomfortable and can develop into serious breathing disorders.
2. **Do not splash beginners** who are very tense and experience a great deal of physical and emotional shock from the water, particularly water which is below 75 degrees Farenheit.
3. **Do not push anyone off a dock or boat** before they have learned to swim one good stroke. After they have learned a stroke, many will need a push to help them develop their courage, but **never** before they have learned to swim.
4. **Do not force swimmers to do a face float** if it makes them dislike the water so much that swimming will be a lost skill to them. There are many ways of getting used to the water and learning to swim without doing a face float.

There are thousands of people who have never again attempted to learn to swim because they have experienced one or more of the above situations. There are also many who have had to overcome an unusual amount of tenseness and fear when they have again tried to learn to swim. Extreme tenseness and fear retards anyone in any sport or activity and is particularly noticeable in swimming.

With this handbook, it is my sincere hope that many can learn to swim and can develop their ability in helping others to enjoy swimming, safely and sanely. There are many methods of learning to swim, and only a few have been described herein. This work is written primarily for recreational swimming and diving but it can be used as a basic text for safe and enjoyable swimming by everyone.

If all of the work of the previous chapters has been completed, you are now ready for fancy diving, competitive swimming and life saving. Make swimming your enjoyable and healthful sport. Also let it be the safe road to physical fitness and happiness.

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